

THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. LIV.

SATURDAY, JANUARY 26, 1889.

No. 4.

ORIGINAL ARTICLES.

POISONING BY CHROME YELLOW USED AS A CAKE DYE.

*The Subsequent Clinical History of the Cases, Including a Case of Paralysis Agitans and of Chronic Endocarditis.*¹

BY DAVID DENISON STEWART, M.D.,

CHIEF OF THE MEDICAL CLINIC OF THE JEFFERSON MEDICAL COLLEGE;
PHYSICIAN TO ST. CHRISTOPHER'S HOSPITAL FOR CHILDREN.

I REPORTED, in September, 1887, a clinical analysis² of 64 cases³ of poisoning by chrome yellow used as a cake dye. The present paper is a further history of such of these as I have had under observation to the present, a period of fifteen months.

8 of the 64 died in convulsions. The later history of 12 of the 56 survivors I have been unable to ascertain. Absolutely nothing could be learned of 6 of the 12; they are, however, believed to be living. I regret I am unable to report their condition. They were severely poisoned, after prolonged exposure. Nor could sufficient be learned of the second 6 to justify their consideration here. Several of these were personally questioned but with unsatisfactory results.

At the time the data for the analysis of the 64 cases were being collected, all of the 44 now reconsidered exhibited some unmistakable and pronounced symptoms of plumbism, such as cachexia, colic, arthralgia, or encephalopathy, and the blue line was present in the gums of all save 1. A minority only of the 44 received any continuous treatment, and many of these were in the hands of homœopaths, who, it is believed, did not give eliminants. The health of 31 of the 44 is yet de-

cidedly impaired, and several of the remaining 13 ail slightly.

The lead cachexia is still present markedly in 12. In these the skin has been of a decided earthy-yellow hue, continuously since the poisoning. The gums of 8 of the 12 show a fading though distinct blue line, and are retracted from the teeth. In 3 of the 12 there is a purplish line, and in 1 no trace of a line exists. Considerable anæmia¹ is present in those in which cachexia is yet marked, and in 1 in which cachexia is absent. The mucous membranes and conjunctivæ are pale. In several a venous hum can be heard in the neck; and, in 1, a basic (pulmonary) murmur.² Most of the 12 have breathlessness and palpitation on slight exertion. Several speak of præcordial pain. 8 of the 12 are very dyspeptic; 5 have yet occasional attacks of severe colic which occur unprovoked by food or other known cause. All of the 12 have headache, which in several is severe and constant.

Evidences of functional derangement and of organic disease of the heart have appeared in 7 of the 44 since the poisoning. In 6 of the 7 there are present symptoms of cardiac irritability, such as præcordial pain, increased by exertion and then accompanied by palpitation and shortness of breath. In 2 of these the palpitation and shortness of breath occur often when at rest and in recumbency, as at night. All of the 6 have increased frequency of pulse, and the heart of each is overacting, with accentuation of the second sound at the apex and some increase in the area and force of the impulse. In 3 of the 6 this increase is greater than can be accounted for by mere functional overaction, and other accompanying physical signs and symptoms indicate slight but unmistakable hypertrophy. The seventh case illustrates one of the insidious effects of chronic lead poisoning, a tendency toward slow degenerative changes in the vascular system. There was at first irritable heart, which was succeeded by hypertrophy, and that by a chronic mitral valvulitis with insufficiency. Dilated hypertrophy of the left ventricle then followed.³

¹ Through an utter lack of coöperation and interest on the part of these cases, none of which were my patients, I was unable to obtain a blood examination.

² This was not examined for in all.

³ Professor Da Costa, to whom I showed this case somewhat more than a year ago, when the valve changes were not perceptible, and, later, when they were markedly present, fully agrees with me as to the pathological condition, and as to its plumbic origin.

¹ Read before the Philadelphia County Medical Society, December 12, 1888.

² This paper was published in THE MEDICAL NEWS, December 31, 1887.

³ In addition to these, I have notes of 15 others, making a total of 79 undoubted cases traced to 2 bakers. The 15 include 4 cases of lead convulsions, which in 3 ended fatally. It is unfortunate that I was unable to obtain the histories of very few of the large number of early patrons of Palmer, the baker, who used the dye freely for years in another section of the city than that in which he was apprehended. No doubt there were many interesting cases of plumbism among these.

It is to the point, in this connection, to state that I believe I can trace to lead-poisoning from dyed cakes many cases of disease of seemingly obscure or supposed idiopathic origin, seen in the past year and a half of my service in the out-patient medical department of the Jefferson College Hospital. Among these are cases of pronounced anemia, renal fibrosis, peripheral neuritis, spastic paralysis, neurasthenia, obstinate headache, and, at least, one case of long-standing delusional mania.

The case is that of Mrs. H. H., aged forty-seven. There is absolutely no history of rheumatism, gout, syphilis, or alcoholism. Her health had always been good until the spring or summer of 1886. Attacks of typical lead colic then developed with the usual attending phenomena. These continued, at intervals, until the summer of 1887. There were also present during this period severe headache and constant mental and physical exhaustion. Slight pains in the ankles, unaccompanied by any inflammatory condition, but with sensations of numbness and burning in the soles of the feet, were occasionally felt. When first seen in June, 1887, she had been a patron of Palmer for fifteen months, and had eaten almost daily of the dyed cakes. Her condition then was much as has been stated. In addition, it was noted that she was emaciated and dyspeptic, had palpitation and shortness of breath on exertion, and precordial pain. There was heightened arterial tension, a much overacting, irritable heart, but no murmur. Lead was found in her urine by Dr. Leffmann at this time, and an examination of the eye-ground by Dr. Hansell showed "œdema of both retinæ, with effusion into the right retina below the fovea; pulsation of larger and tortuosity of both large and small veins."

Because of her absence from the city during the summer of 1887 I saw her but seldom. Ailing severely in September following, she presented herself for regular treatment, and has been under constant observation to the present. The mental and physical prostration had persisted, and, in August, coarse tremor, involving the head and limbs, had appeared. The shaking began each morning on rising, and continued constantly through the day. It was especially aggravated by physical exertion. Decided weakness of grasp accompanied it, but no paralysis. She had continuous headache, and palpitation was so troublesome at night that she was unable to rest in recumbency. Early in September there was found extreme overaction of the heart, with undoubted hypertrophy of the left ventricle. No murmur, however, could be detected until about the 14th of October following. There had then developed a faint systolic mitral bruit, which was accompanied by distinct accentuation of the pulmonary second sound. Palpitation was now more distressing than formerly, and was associated with attacks of shortness of breath and of dyspnoea by day, but oftener by night. Prior to this, believing renal fibrosis was in progress, the urine, which had been of a low gravity and profuse in amount, had been frequently examined for albumin and casts, but always with negative results. Shortly subsequent to the development of the murmur albumin appeared, detectable at first only with picric acid, but soon with nitric. The amount never exceeded a gramme to the litre, and was usually less. Coincident with the appearance of the albumin the urine diminished in quantity, and hyaline and granular casts were very often found, sometimes in large amount.

The remaining facts in the case are concisely as follows: The mitral murmur became louder, and the area over which it could be heard greater. Evidences of stretching of the left ventricle soon appeared, and,

with these, signs of overloading of the pulmonary and general venous circulation assumed prominence. The attacks of dyspnoea at night deepened into orthopnoea. There were cough and frequent blood-spitting. The ankles and feet were at first puffy, and then swollen. Purpuric spots appeared on the legs. The portal circle was constantly congested, causing an icteroid hue of skin and pronounced gastro-intestinal catarrh.

This condition of things continued pretty constantly until the spring of 1888. She then improved very steadily, and the more pronounced signs of "back-working" were only occasionally present. Since April last the daily quantity of urine passed has been normal or above, and albumin and casts have been absent. All the usual symptoms of plumbism had disappeared at this time. The tremor persisted intermittently for months, but grew less and less frequent as her condition ameliorated.

The physical signs referable to the heart are now those of mitral regurgitation and dilated hypertrophy of the left ventricle, with hypertrophy in excess of the dilatation. The murmur is very distinct, and has the usual characteristics of that of mitral insufficiency. Though there are yet almost constantly present some indications of mechanical derangement of the circulation, such as œdema of the ankles and legs, congestion of the portal viscera, and, at times, of the lungs with blood-streaked sputum or actual bloodspitting, and attacks of bronchial catarrh, freedom from excessive palpitation in the past few months could be obtained only by the persistent use of aconite. Digitalis and strophanthus, which, in moderate doses, were of service a year ago, now aggravate the palpitation, and do not materially lessen the tendency toward venous congestion. The attacks of dyspnoea, which occur once or twice weekly, are relieved, as before, by free dry cupping of the chest. Restorative agents, such as arsenic, iron, and the vegetable tonics, are employed to improve nutrition. Frequent resort to purgatives is necessary to relieve the portal stasis.

I have no doubt that some cases of chronic endocarditis, the origin of which we are at a loss to account satisfactorily, a history of acute articular rheumatism or of strain not being obtainable, are of lead origin.¹ Lead is, I believe, a more frequent

¹ Chronic valvulitis, as a result of lead poisoning, is not uncommon. Duroziez reported (*L'Union Médicale*, December 15, 1885) eleven cases of mitral stenosis and one of aortic regurgitation, occurring in plumbic subjects in whom there was absolutely no other assignable cause for the valve affection.

A typical case of lead endocarditis, originating aortic stenosis and mitral regurgitation, is that of B. F. K., a painter for twenty-eight years, who has been under constant observation in the outpatient medical department of the Jefferson College Hospital since 1881. He first presented himself for treatment because of obstinate colic and an ileocolitis which had arisen in consequence of lead-poisoning. There was a well-marked blue line, typical lead cachexia, constant headache and vertigo, and distressing arthro- and generalized neuralgia with cramps in the muscles of the extremities, and jerking of the limbs. The urine was free from albumin. His heart was examined on several occasions by Prof. Da Costa between 1881 and 1885. On the first exploration there were found considerable overaction, and a soft

cause of chronic endocardial inflammation than gout, syphilis, or alcoholism. Even where a doubtful history of rheumatism exists, we should not be deterred from an inspection of the gums and an inquiry as to the possibility of lead poisoning in the past. In all cases of valvulitis of seemingly obscure source this should be done as a matter of routine. A caution is necessary that a mere history of pains in and about the joints must not be accepted as undoubted evidence of rheumatism, without a careful investigation as to signs of accompanying arthritic inflammation; for it is undoubtedly a fact, of which I have seen striking examples, and the non-recognition of which by practitioners has caused many lead cases to be overlooked, that arthralgic pains are among the most common of the protean manifestations of plumbism; and that they may persist for lengthy periods entirely without other noticeable symptoms, save, perhaps, cachexia; and that even the latter may be absent in undoubted cases.

An abnormally forcible cardiac impulse, with accentuation of the aortic second sound and increased tension in the peripheral arteries, is constantly present in many cases of lead cachexia. In these a tendency toward insidious valvular changes must be great, and this is no doubt favored by the state of faulty nutrition and anæmia always existing in such cases. Simple anæmia is supposed sometimes to originate chronic valvulitis, through the augmented arterial tension present in its earlier stages causing increased backward stress on the valve curtains, and especially on the mitral leaflets, which, with each ventricular systole, are subject to a force equalling the resistance of the whole arterial circuit. Since the conditions favorable for the production of chronic valvulitis are more constant and decided in plumbism than in ordinary anæmia, it is not unlikely that chronic lead poisoning is oftener a cause of slow valve changes than mere poverty of blood. Having in mind the wide prevalence of lead poisoning and the frequency in the past year and a half with which I have encountered cases of somewhat obscure type, which no doubt I would have previously overlooked, because not on the watch for them, and seeing repeatedly in my service in the out-patient medical department of the Jefferson College Hospital cases which have passed through the hands of other practitioners unrecognized, I

systolic murmur limited to the apex. In the autumn of 1884 the area of cardiac dulness was found to have considerably increased. The apical murmur was very distinct, rather harsh in quality, and was well transmitted toward the inferior angle of the left scapula. There was now present a systolic right basic murmur, distinct in quality and pitch from the apical bruit, and heard in the carotid artery. There had been frequent cardiac pain, attacks of palpitation, and signs of arterial ischæmia. At the present writing the mitral and aortic murmurs are very distinct. Compensation is good.

believe it probable that mitral stenosis, often met with as an insidious affection in young anæmic women free from rheumatic history, not infrequently owes its origin to unsuspected lead poisoning.

Disorders of digestion are prominent in a number of the 44, independent of colic or colicky pains. One (Mrs. G. A.), who was so prostrated by long-continued colic and arthralgia, that she was confined to bed for two months, and lost thirty pounds in flesh, has, in addition to attacks of severe generalized headache, constant gastric irritability. A trifling dietetic error which in health would not affect her, now readily provokes vomiting.

Obstinate constipation is yet present in 7. In these the bowels do not move without purgatives.

A chronic catarrhal enteritis has existed in 1 since his first attack of colic fifteen months ago. There are five or six loose passages for three or four days, succeeded by two or three days of constipation. Abdominal tenderness and pain are felt, in addition to colic which is yet frequently present though in a milder form. He had arthralgia affecting the knees and ankles for months, so severe that he was compelled constantly to maintain the recumbent posture. He also had wrist-drop.

Apart from slight colicky pains, which have been frequent in many since the abatement of pronounced symptoms of plumbism, and which, in a few, may be traced to dietetic errors, paroxysms of abdominal cramp having all the intensity and character of true lead colic, yet occur in 5. The seizures appear at longer intervals, as time passes, and are lessening in intensity. At first the interlapse averaged from ten to fourteen days, and the duration of the attack was three to seven days, but the former gradually lengthened and the latter diminished, until recently, in each of the 5, a severe seizure occurred about every four to eight weeks, and lasted from one to three days. None of these cases received regular treatment. In all there is reason to believe lead is yet present in the system.

Pains about the joints and in the muscles in their vicinity yet occur in 15.¹ In some the pains have been constant, with exacerbations and remissions; in others they have occurred intermittently every five to thirty days, in attacks lasting three to ten days. The ankles and knees, and the neighboring muscles are most frequently affected in 9; 3 of these have in addition sharp stabbing pains in the wrists, and 1 of the latter, pain in the hip. In 2 others the ankles, knees, and hips are equally affected; in 1 solely the ankles and wrists, and in another the lumbar and sacral regions. Dull and aching, burning or darting pains in the muscles

¹ 13 of these received no treatment, save from homœopaths; the remaining 2 were under a regular physician's care for two or three weeks when first affected.

adjacent to the affected joints accompany the arthralgia in all, and these muscles are yet the seat of frequent painful cramps. 2 have, beside the joint pain, very sharp darting pains in the forearms and wrists, in the course of the nerve trunks, associated with some loss of power and weakness of grasp. In 2 others¹ severe burning in the soles of the feet, alternating with numbness and tingling in the feet and hands, is sometimes felt simultaneously with the arthralgia.

Very painful and persistent inframaxillary neuralgia is present in 2 of the 15. Neither has carious teeth, and each has had several sound teeth extracted without the pain ameliorating. Aching in the right clavicle frequently accompanies the arthralgia in 1. General muscular aching and loin pains persist in 3. It is believed that inflammatory conditions of the joints, such as redness, heat, or swelling, at no time occurred in these cases. They were frequently searched for. The pains in nearly all are aggravated by night. Damp and cold weather increase them in 5.

I was recently able to ascertain the state of cutaneous sensibility in 8. Some anaesthesia was present in the area supplied by the peroneal nerve and its terminal branches in 2; there was plantar anaesthesia in 2 others; in 4, sensation was normal or hyperaesthetic in the painful extremities. No tendinous swellings about the wrists, or elsewhere, were noticed in any.

It is difficult to decide as to the exact influence of lead in the production of the arthralgic pains in these cases. Their character and seat, and their continuance in those that received no eliminative treatment, and that yet show evidence of plumbism, suggest they are in most of the 15 a mild form of the articular and muscle pains which were present in 47 of the 64 when these cases were thoroughly investigated over a year ago. Our knowledge of the peculiar morbid state underlying so-called lead arthralgia is too slight to permit us to assert that the same pathological conditions always exist. In most of the 47 the symptoms were originally those of aggravated neuralgia of the joints, bones, and intramuscular nerves. In not a few who were under observation for a considerable period and received no regular treatment, while the arthralgic pains were prominent, there were present symptoms suggestive of neuritis, such as sharp pains in the muscles and in the limbs in the course of the nerve trunks, often with decided tenderness on deep pressure; alterations in sensibility such as paræsthesia, hyperæsthesia, and anaesthesia; weakness in the limbs; rigidity, and frequent cramps in the muscles.

The electrical reactions were taken in several of

these cases, but no quantitative or qualitative changes were found. The examinations, however, were made at too early a period for the negative result to be of much value in the diagnosis of the condition.

In none did the character of the symptoms suggest that the pains were of a gouty nature, nor do they now in the 15 under consideration. The smaller joints were unaffected, and no inflammatory appearances accompany the pain in the large joints. It is not unlikely that slight deposits of urates may occur in a joint, and no appreciable objective phenomena at once arise. Yet this condition could scarcely continue long without an inflammatory outbreak. There is no doubt that a special predisposition to gout exists in subjects of chronic plumbism, and it is not improbable that slight joint pains, with aching in the limbs, and muscular cramps, ephemeral neuralgias, headache, vertigo, and mental depression, occurring in such subjects, are sometimes symptoms rather of the gouty or lithæmic state induced by lead than of the direct action of that metal. Where doubt is felt, it is of diagnostic importance to examine the urine and blood-serum, quantitatively, for uric acid. I have, as yet, been unable to do this in any of the 15 arthralgic cases. It was probably excreted in deficient amount in at least 2. The urine of these has been more or less scanty, since pronounced symptoms of plumbism were present; it often deposits urates, and fits of the gravel occur. An unsuccessful effort was made to get specimens.

At the date of the preparation of the clinical analysis of the 64 cases, complete paralysis of the extensor muscles of the forearms (typical wrist-drop) had occurred in but 2; bilateral weakness of the extensors of the fingers existed in 1 other, and in 2 others there was slight loss of power in all of the extensors of the fingers and of the wrists, without actual paralysis. In the third-mentioned of these cases (1 of the 44) complete forearm extensor paralysis afterward occurred. In the 2 last mentioned the ataxia disappeared without paralysis ensuing. So that complete wrist-drop was met with in but 3 of the 64 cases, and it was not encountered in any of the other (15) cases of the chrome yellow poisoning traced to the same source, of which I have notes. This exemption among so many cases of pronounced plumbism in which the rarer condition—encephalopathy—occurred so frequently, is quite remarkable.

In none of the 3 cases did the paralysis extend to the upper arm or involve the supinator longus. Complete recovery has taken place in 1. In 2 of the cases power has been partially regained in the extensors of the wrist, so that the hand can be incompletely extended if the fingers are flexed into the palm, but the extensors of the fingers and thumb in both cases are yet too ataxic more than very slightly to extend these members or the hand itself

¹ The plantar surfaces in these cases were somewhat anæsthetic.

if the fingers are first passively straightened at the metacarpo-phalangeal joint. The paresis is greater on the left in 1; in the other, it is equally marked on both sides. Sensation is unaffected. Considerable atrophy exists in the situation of the paretic muscles in each case. Neither would come for electrical examination. It is presumed reactions of degeneration are present. 1 case is known to have taken for some weeks potassium iodide; the other received no treatment.

In 1 of the 44 in which typical paralysis agitans has developed, presumably as a result of lead poisoning, there exists, in consequence of weakness and stiffness of the forearm muscles, lack of complete extension of the hands and fingers on the wrist, more marked on the right. This case is of especial interest and worthy of detailed report, because it is generally supposed that although lead may occasionally originate tremor resembling somewhat that of paralysis agitans, the typical "shaking palsy," of Parkinson does not arise in consequence of poisoning by that or other metals.

Mrs. Mary McF,¹ aged sixty-one years, occupation general housework. One of a family¹ of seven all of whom were severely poisoned from the same source. She had eaten the chrome yellow buns for nearly a year before symptoms other than cachexia, constipation, arthralgia, and slight colic, appeared. In June, 1886, she was seized with recurrent attacks of lead colic, lasting four to ten days, with intervals of about one week, during which slighter abdominal cramps, with nausea, vomiting, and constipation persisted. I visited her frequently in June and July, while investigating other cases of poisoning. All were studied with great care and it is absolutely certain that she was free from tremor then and before. In addition to colic, which persisted through the summer and autumn, attacks of generalized headache were now present with neuralgic pains in the joints and limbs. She lost flesh and strength, was depressed mentally, and sleepless. Tremor of the right hand and fingers was first noticed early in October, while plumbic symptoms were yet prominent. It was then slight and inconstant and appeared usually after mental or physical fatigue, but ceased on voluntary effort, by exercise of the will and during sleep.

I now lost sight of her until September, 1888. Since then she has been under constant observation. The following are the additional facts in her case from October, 1887, to the present.² She at no time received continuous treatment directed toward eliminating the lead. I had endeavored to persuade her to take potassium iodide. After a five days' trial

she desisted, believing it aggravated colic and headache. Her health had always been robust until she suffered from plumbism. She had never had tremor before, nor had she ever received a physical injury or mental shock. No hereditary history of any neurosis is obtainable. Her people were sturdy Irish, who died rather of old age than of any disease. Umbilical colic and severe loin pain yet occur intermittently. She is dyspeptic and constipated, and has a marked blue line, with retracted gums and discolored teeth. Her skin is earthy-yellow and conjunctivæ are icteroid. There has been quite constant headache since the autumn of 1887, but it is less pronounced now than during the preceding winter and spring. Its situation is at times frontal and occipital but it is usually severest about the vertex. It is sometimes a deep-seated heavy ache, at others it is sharp and shooting. Recumbency and the approach of night greatly aggravate it. Sleeplessness and restlessness continue and she is disturbed at night by dreams of so frightful a character that she rouses the neighbors by her shrieks.

Tremor of the right hand and fingers increased rapidly in degree, and extended to the forearm and arm soon after its appearance. By the third month the right foot and leg were noticed to shake while she was seated. Seven months later (August, 1888), fine tremor appeared in the left lower limb. The facial muscles, and those of the tongue, eyeballs, neck, and left upper extremity, are entirely free from even slight tremor. The right upper extremity, especially the fingers and hand, is in a continuous state of almost uniform, coarse movement, which ceases instantly and absolutely—though momentarily—when voluntary effort is made with it, such as buttoning or unbuttoning the dress. If the effort is continued, after a few moments the tremor returns slightly, and it starts into redoubled violence on cessation of the effort, unless it be carried to complete and lengthy exhaustion of the arm muscles. Thus, having found that the constant jerking prevents sleep, she has for several months been in the habit on retiring of tossing the right arm about sometimes for hours, until, from sheer muscular weariness, tremor is no longer perceptible and sleep comes. It ceases absolutely during sleep. Mental excitement greatly augments it. All efforts of the will directed to control it are now ineffectual, and, indeed, rather increase it. If the tremulous hand is forcibly held, the movement becomes more violent after a moment, and tremor then appears in the opposite arm, and if she is sitting, that present in both legs grows coarser.

Her handwriting is suggestive. Always disliking writing, she had not before held a pen for years. This renders the zigzag character of the strokes in the specimen more interesting. For, were she used to the pen, the tremor, which ceases momentarily on voluntary motion, would perhaps have permitted her to complete the few words before it reappeared. As she is unaccustomed to writing, the will does not readily direct the hand. The movements are deliberate and the up and down strokes slowly and somewhat hesitatingly made. Time is therefore afforded the tremor to recommence.

¹ This case recently visited me several times in the medical clinic of the Jefferson College, and was shown by Prof. Da Costa to the class. I may state he is fully in accord with me both as to the diagnosis and as to the probable origin of the disease from lead poisoning.

² 2 of the 3 cases of wrist-drop occurred in this family.

³ November 15, 1888.

Muscular weakness; stiffness, and some fixation of the limbs are present, but are not yet nearly so characteristic as the tremor. The grasp as measured by the dynamometer at different times recently, varied between 15 and 33 with the right hand, and between 35 and 40 with the left. Incomplete extension of the hands and fingers seems to be due largely to rigidity of the flexors, as force is required to extend passively the fingers at the metacarpo-phalangeal joints. The forearms are slightly flexed and stiffened at the elbow. There is some rigidity of the anterior cervical muscles, and muscles of the shoulders, which slightly inclines the head forward and causes stooping. In the inferior extremities the rigidity is greatest at the knee-joints and in the adductors of the thigh; more marked on the right.

Voluntary movement is slow, but the gait is as yet not festinating, nor is there propulsion. The facial muscles are unaffected. There is no festination of speech; articulation is slow rather than rapid, but it is monotonous and not syllabic. She is said often to "mix" her words. This I have not noticed. The knee-jerk is exaggerated on both sides. There is no ankle-clonus. Muscular nutrition is poor. The mechanical irritability of the muscles is increased, and there is quantitative diminution to both galvanism and faradism, especially the latter. This is most pronounced in the extensors of the forearms and in the right deltoid, but it is throughout more marked on the right side. Sensations of heat are absent. A feeling of constant chilliness has been present for nearly a year. It was as great during the summer as in cold weather.

Tactile sensation was carefully taken on three separate occasions, and, contrary to what is the rule in this disease, it was twice found very decidedly impaired. This was manifest on all surfaces of the arms, shoulders, and legs. It was not taken on the trunk or thighs. The whole surface of the right upper extremity was especially anæsthetic. This condition was noted in September, and again in the early part of October, 1888. Six weeks later, on casually retaking sensation in the finger-tips and hands, I was surprised to find the anæsthesia had disappeared. The cause for this is not clear. It is, however, unlikely that the loss of sensation had any direct dependence upon the paralysis agitans. Most probably it was of plumbic origin, had existed for some time, and was in process of disappearing when she came under observation this autumn. Lead was found in her urine in August, 1887. Albumin and sugar are absent.

The eye-ground was recently examined by Dr. Hansell, who reported: " $R. \frac{20}{XL}$; $L. \frac{2}{CC}$; opacities in cornea; double optic atrophy with choroidal ring and slight cup. The arteries and veins are small. Pupils normal."

Mental and physical depression is still a constant symptom in 10 cases. Headache is present in 8 of these, which before plumbic symptoms appeared were free from it. In several it is described as a diffused, deep-seated ache. In 3 it is severest in the frontal

and occipital regions. In all of the 8, until quite recently, it was constant, with exacerbations and remissions. It is now of far less severity than formerly.

In 5 of the 8 the urine was examined for albumin, but with negative results. In one of these cases (Mrs. S.) in whose urine considerable lead but no albumin was found a year ago, and who had for months epileptiform convulsions of undoubted lead origin, subacute mania developed with hallucinations of sight and hearing and delusions of persecution. This condition still exists. In another (Mrs. G. W. L.), last seen in September, 1888, an eye-ground examination disclosed œdema of the temporal side of each nerve and tortuosity of the veins. Headache, worse at night, has been constant with her for more than a year. She now is melancholic, and has delusions of conspiracy. There are restlessness and sleeplessness at night and bad dreams. Her skin is sallow. The gums and teeth are still discolored by lead. There are arthralgic pains; dyspeptic symptoms; complete anorexia; a tense, full pulse; overacting heart, with a markedly accentuated aortic second sound. Her urine, recently examined, was of low gravity, but contained no albumin. Lead was not sought for, as the quantity furnished was small, and she would not take potassium iodide.

One other of the 5, a girl, aged seventeen years, had an attack of chorea, during January, February, and March, 1888, while decided cachexia, colic, and the blue line were yet present. She had never had rheumatism, and no family history of it or of chorea can be elicited. Her heart was functionally disturbed, but there was no murmur. None of these 3 cases received any regular treatment.

Curious spells of generalized tremor, of brief duration, have occurred in 1 of the 44 (Mrs. D., aged thirty-eight years), for the past sixteen months. An attack consists of a sensation of numbness starting in the wrists, and rapidly spreading over the body. There is then a feeling of impending danger, and immediately coarse, uncontrollable tremor seizes the head and limbs and continues for a half-hour or longer. Profuse diuresis generally takes place on its cessation. There is no loss of consciousness or tendency to spasm. The fit is not hysterical, nor are there at any time indications of the hysterical state. Motility and sensation are unaffected in the intervals. They were not tested during or immediately subsequent to one of the seizures. These spells occur about every three to five weeks irregularly; not at the menstrual period. Appropriate remedial measures directed to prevent their recurrence have the desired effect when pursued with regularity. She will not continue treatment sufficiently long to be entirely rid of them. This woman had con-

vulsions in April, 1887.¹ Five of her children were similarly affected about the same time, and four died.² Another was born in May, 1887, while symptoms of lead poisoning were yet present. This infant was undersized and cachectic at birth, and, though not suckled by the mother and every effort was made to raise it, it did not thrive. When aged four months, rhachitis developed; paroxysms of laryngismus stridulus were frequent, and death took place in convulsions in the tenth month.³

The appearance of the gums and teeth in 24 of the 44 cases is yet indicative of plumbism. But 3 of the 24 received eliminative treatment. A decided though fading blue line is present in 10, a distinctly bluish-purple line in 5, and a purple in 9. In 12 of the 24 there is much retraction and atrophy of the free margin of the gum, permitting considerable exposure of the neck and fang surfaces of the teeth, which, together with the crown surfaces, in the greater number of the 24, are yet discolored by lead sulphide. The free margins of the gum in many of the 24 are hemorrhagic. In these, slight friction causes venous oozing. The purple line is present in the situation previously occupied by the blue. In many of the cases I have watched this discoloration of the free gingival margin through its varied phases. It is of diagnostic interest to note that at first the so-called "line" consists of a number of fine black dots irregularly distributed, or an aggregation of them, forming a narrow bluish-black streak in the interdental portion of the gum, or in the extreme edge of the free margin, grasping one or more teeth, usually the lower bicuspid and molars, the teeth which are apt to be longest in contact with particles of food and about which decomposition of food elements is likely to be greatest.

Friction renders the pigmentation more distinct and perhaps causes slight hemorrhage. If the poisoning is slight and the absorption of lead ceases, the pigmentation slowly fades without destruction of the affected edge of the gum and no retraction of the gingival margin occurs. In several cases, three months after the lead ceased to be ingested, the narrow black streak or the fine dotting in the thin edge of the gum was distinctly visible, and at the end of a year the same thin edge was of a purple color.

Continued absorption of lead in considerable

quantities produces an intense bluish discoloration of the buccal gingival margin several lines in breadth in the gums about the teeth in the upper and lower jaw. The lead sulphide, deposited in the lumen of the vessels, in their walls, and in the perivascular tissue, interferes with the nutrition of the affected portion of the gum and leads to its partial atrophy. The gums become exceedingly hemorrhagic so that the slightest friction causes venous oozing. Their dental margins in some situations become, after a time, fringed, and retracted from the neck of the teeth, exposing a part of the fang. When the blue line is decided, the crown, neck, and the denuded fang surface of the teeth are apt to contain a black deposit of lead sulphide, which persists for months after exposure to the poisoning has ceased, and then gradually fades, giving place to a yellowish-brown stain.

At a variable period following the cessation of the systemic absorption of lead, the extent depending largely upon the severity of the poisoning and whether efforts have been made to eliminate the metal, a bluish-purple discoloration succeeds the bluish in the affected portion of the gum, and it, in its turn, is succeeded by a purplish, and this by a red line entirely without any element of blueness.

In conclusion, I desire to express my indebtedness to Dr. Leffmann for examining the urine of a number of the cases for lead, and to Dr. Hansell for eye examinations.

2620 NORTH FIFTH STREET, PHILADELPHIA

YELLOW FEVER. AN EXPERIMENTAL RESEARCH ON ITS ETIOLOGY.¹

By PAUL GIBIER, M.D.,

ASSISTANT TO THE CHAIR OF PATHOLOGY OF THE MUSEUM OF PARIS,
EX-HOUSE PHYSICIAN OF THE HOSPITALS OF PARIS, ETC., ETC.,
ENTRUSTED WITH THE MISSION OF STUDYING YELLOW
FEVER BY THE GOVERNMENT OF THE
FRENCH REPUBLIC.

In the beginning of 1888, I presented simultaneously to the Academy of Sciences of Paris and to the Academy of Havana, the result of the researches that I had undertaken on yellow fever, begun in the month of November, 1887. Since that time I have given a lecture on the whole of my work on the subject to the Academy of Medicine of Paris.² In September, 1888, in consequence of these studies, the French Government, which four times before had honored me with its confidence for different medical investigations, commissioned me to go to Florida and study yellow fever which was prevailing there at that time.

¹ A paper read before the New York Academy of Medicine, January 17, 1889.

² *Vide* Bulletin Médical, of Paris; THE MEDICAL NEWS, The Lancet; Cronica Medico-Quirurgica. and Revista Clinica of Havana, etc., 1888.

¹ Her urine was slightly albuminous at that time. The albumin disappeared very soon after treatment was begun to eliminate the lead, and has at no time been present since.

² *Vide* "Notes on Some Obscure Cases of Poisoning by Lead Chromate," THE MEDICAL NEWS, June 18, 1887.

³ All of the five infants born of mothers exhibiting symptoms of lead poisoning during gestation had convulsions; four within two months after birth. Three of the five died in them. Another infant, born in July, 1888, of a mother who had pronounced lead poisoning during the early months of pregnancy, died in the fourth month in convulsions.

When I arrived at Jacksonville, Fla., the epidemic had begun to diminish, but nevertheless, thanks to the courtesy of Surgeon-General Hamilton and of Dr. Porter, chief of medical relief at Jacksonville, I was able to examine as thoroughly as possible several subjects who died in the town, or in St. Luke's Hospital, where I had located my laboratory.

Before presenting the details of the cases I have observed, it will perhaps not be useless to examine a question which many physicians have asked themselves, and which they do not consider as being settled, viz.: *Was it veritable yellow fever which was observed last year in Florida, and in a few localities in the surrounding States?*

The relatively small mortality, and also the fact that the blacks were attacked in larger proportion as compared with the whites, have been the cause of these doubts. However, it is proper to remark that if in the West Indies they consider the black and even the mulattoes as having immunity from yellow fever, in the epidemics which have prevailed in the United States, on the contrary, the disease has been observed as well among the blacks as among the whites. (New Orleans, Memphis, Savannah, etc.) Moreover, in Jacksonville, a few days after the outburst of the epidemic, most of the white families left the town, comparatively few but negroes remaining. I shall add that it was remarked that, generally, the symptoms were less grave in the latter, and the fatality less considerable than amongst the white people.

Whatever it may be, I do not think that the question ought to be so simply stated; and according to my opinion, it is more complicated; and I think it is necessary to examine:

1st. If it was really yellow fever which was observed in the last epidemic at Jacksonville?

2d. In case of a negative reply, if it was a new disease?

3d. If all the cases registered were genuine? In other words, if there were not at the same time several kinds of fevers, as bilious, dengue, or malarial fevers more or less grave; and

4th. If yellow fever might not have assumed (at least in a certain proportion of the cases) a kind of hybridity, owing to the malarious character of the country?

Relying upon my observations, I will endeavor to answer briefly and in a general manner—not in detail—these several questions.

In limine I present it as a fact that many cases of yellow fever were observed in Jacksonville. For my own part, I have seen some cases absolutely characteristic, judged as well by the symptoms as by the anatomico-pathological lesions.

But it is not irrational to admit that a concomitant epidemic of bilious fever and many cases of malarial

intoxication have existed simultaneously with yellow fever. On the sixteenth of November I made, at St. Luke's Hospital, the examination of a black subject who died on about the ninth day of his disease. I found the bowels normal; the liver was black instead of presenting the special color; the spleen was hypertrophied. I have no doubt that the patient succumbed to bilious fever; but, however that may be, it is certain he had not yellow fever.

At the temporary hospital (Sand Hills Hospital) Dr. Solace Mitchell showed me the thermometric charts of the patients, and in the greater number of them we noticed, by the intermittent form assumed by the fever (however the case terminated), that the paludal element awakened by the recent disease had stamped, as it were, its mark upon it, and made it assume one of those *hybrid* forms to which Prof. Verneuil, of Paris, has called attention.

It is likely that the cases, in diagnosing which the observer hesitated, have been found, not in the centre of the town, but in the suburbs, and on the opposite side of St. John's River (South Jacksonville), where the sanitary condition is not calculated to preserve the inhabitant from malarial fermentations. It is easy to come to such a conclusion in view of the great number of shallow pools into which, as on the Ganges' shore, the neighbors throw their dejections. Observation VII., which I report hereafter, concerns a case which took place, precisely, in one of these localities; it seems, in my opinion, to belong to the category of pernicious fevers.

Before continuing this exposition I think it is necessary for me to quote the bacteriological observations that I have made. I regret having but a few cases to present; nevertheless these are interesting facts, and I may already say that they confirm entirely the more numerous observations that I recorded in Havana, at the end of 1887 and in the middle of 1888.

The *modus operandi* has been as follows: The substances which have been planted in cultures have been handled with all the precautions that are required; the liquids with sterilized Pasteur's pipettes and the solids (visceral matters) by means of a process that I have invented and which I will describe briefly. I obtain matter from the interior of a viscera by the use of a curette analogous to those which are employed for scraping the cervical cavity of the womb, with the difference that my instrument is curved instead of being straight. I cauterize, with a heated wooden-handled spatula, the viscera recently removed from its natural cavity, at the point into which I shall introduce the instrument, after having passed the latter through the flame. I plunge it into the parenchyma, revolve it several times, and withdraw it filled with pulp, which is then mixed with

dissolved agar-agar or gelatine. The rest of the operation is executed as usual. If the post-mortem is performed far from the laboratory, I dilute the pulp obtained by the scraping with sterilized water, which is used afterward for the cultures on plates, the Esmarch's tubes, or in the Gibier's matrasses.¹

A large quantity of tissue may be planted in that way, and if the organs contain cultivatable microbes² it is almost impossible not to obtain a great number of colonies.

Obs. I. and II.—The pieces taken in the first two post-mortems have been altered because of the delay, caused by the quarantine, in receiving my instruments, which got to Jacksonville eight days after my arrival. I notice these two cases, observed at the Sand Hills Hospital, only in order to relate that they presented the characteristic lesions of yellow fever.

Obs. III.—St. Luke's Hospital, Nov. 2, 1888. Man, forty-two years old (white). Autopsy immediately after death. Taking urine from the bladder, blood from the heart (right and left ventricles), bile, and hepatic, splenic and renal substances, and black intestinal matter, I made cultivations of them. This is the summary of the results given by the cultures: Blood, sterile; bile, sterile; urine, sterile; kidneys (two Esmarch's tubes), first tube, sterile; second tube, one colony of a small micrococcus. The liquid at the bottom of the tube, although clear, contained some large and long bacilli. Spleen, three colonies of a large micrococcus. Liver (two Esmarch's tubes), one tube sterile, the other contains four colonies of large and long bacilli. *Intestinal contents*: black, neutral, different microbes in the cultures, but none dissolving the gelatine.

Remarks.—In this observation, the intestine did not contain the bacillus I found in such large quantity formerly in Havana. If this bacillus is really the cause of yellow fever, we must admit that, under still unknown influences, it may disappear after having produced the special intoxication. The same phenomenon is observed in a large proportion of cases of Asiatic cholera in regard to the comma bacillus of Koch. It may be thus satisfactorily explained in an affection which has lasted eight days.

As in my former observations, the blood did not contain any microbe. I shall add that the microscopical examination of it showed nothing abnormal either in the fresh state, or in desiccated or fresh, variously colored preparations. *It has been the same in all my observations without any exception.*

As for the different microorganisms which developed in the cultures in the viscera, the number of

the colonies was so small, and so various their composition, that we may admit that an accidental infection took place during the manipulations. But with the cultures in solid *media* there is no reason to fear the same errors as with the liquids. In the same conditions a liquid *medium* would have been full of organisms which would have developed freely. In the solid *media*, on the contrary, a germ fortuitously introduced (during the various manipulations undergone by the preparations) remains where it is caught, but cannot invade the whole of the culture. If a microbe does exist, which might proliferate primarily in liquid and not in solid *media* (which as yet has not been seen), this microbe could multiply easily in the bottom of the Esmarch's tubes, where, after coagulation of the agar-agar, a certain quantity of bouillon accumulates always.

Although I admit (as I have in my preceding publications) the introduction of the microorganisms into the viscera, as a possibility, owing to the alterations of the mucous membrane, I consider the cultures of the liver, of the spleen, and of the kidneys of the preceding observation as having remained sterile.

Obs. IV.—Duval Co. Hospital, November 3. Man, forty-five years old (white). Carried to the hospital in a semi-delirious state, increasing till death. Antecedent history obscure.

This case, for which I am indebted to the kindness of Dr. Drew, attending physician, did not present any characteristic anatomico-pathological sign. Post-mortem one hour after death. The skin and the subcutaneous cellular tissue presented a yellowish coloration. The urine, which could not be examined during the short sojourn of the patient in the hospital, taken and analyzed after death, contained a large amount of albumin. No possibility of knowing if the patient was catheterized before his admission into the wards. A muco-purulent discharge from the urethra. The bowels were almost empty, no congestion; the colorless matter which clung to its walls was neutral. The stomach, the walls of which were injected, contained a small quantity of a brownish liquid with some dark particles. Kidneys congested. Liver brown.

Some cultures were made with blood, bile, urine, kidneys, spleen, liver, and gastric and intestinal contents. Results of the cultures: *Blood*: sterile. *Urine*: a few colonies, a *micrococcus* of a medium size, growing on the surface of the agar, small colonies, poor, irregular, not liquefying the gelatine. *Bile*: rare colonies of a *torula* growing slowly. *Spleen*: four colonies of a large *micrococcus* and a colony of a mycelium (accidental infection). *Kidneys*: sterile. *Liver*: sterile. *Stomach and bowels*: common microorganisms. Do not liquefy the gelatine.

Remarks.—It is very doubtful if this patient succumbed to yellow fever.

Obs. V.—Case kindly furnished by Dr. Webster. Woman, thirty-five years of age (slightly colored,

¹ Vide on these matrasses: Bulletin Academy of Medicine of Paris, September, 1888, and Journal de l'Antisepsie, Masson, Publisher, Paris.

² With a smaller curette the same process may be used for experimental work generally, and especially in tuberculosis, with the viscera of small animals, as the guinea-pigs.

"octoroon"), died at the jail, after four days' illness. She had presented the characteristic symptoms of yellow fever (black vomit, large amount of albumin, etc.).

Nov. 7. Autopsy, eight hours after death. Icterus very intense; yellow coloration of the adipose tissue. Liver: "nutmeg" or "café au lait." Spleen small. Kidneys congested. Bladder empty.

The stomach and bowels contain a large amount of black liquid, *acid* in the stomach but decidedly *alkaline* in the small intestine and neutral in the large. Cultures of blood, kidneys, liver, spleen, and intestinal contents. The cultures of the blood remained sterile. The kidneys, the spleen, and the liver contained a certain number of *diplococci*, the colonies of which spread quickly over the surface of the agar-agar, under the semblance of a semi-transparent cloud; they dissolve the gelatine very rapidly. It is the first time I saw this microorganism. I did not find it in the bowels. It is also the first time that I found a microbe in the parenchyma of the viscera of a subject dead with yellow fever; but I must call attention to the fact that the autopsy was performed eight hours after death, in a surrounding temperature relatively high (the interior of the subject was still warm); all conditions very propitious for the growth of the bacteria of decomposition.

Some particles of the contents of the bowels, taken from different parts of the digestive canal, were diluted with sterilized water, and with them I made cultures on gelatine in my matrasses. Notwithstanding the large dilution, the colonies were so numerous that after twenty hours the gelatine was entirely dissolved in the first two matrasses. In the third (fourth dilution) on 106 colonies I counted 98 which liquefied the gelatine.

I call attention to the importance of this fact: *all those liquefying colonies were formed by the microbe that I had isolated in Havana.*

Obs. VI.—St. Luke's Hospital, November 13th. White man, forty years of age. Died the eighth day of his illness, after having presented the classic symptoms of yellow fever. Autopsy one hour after death. Cultures with blood, urine, kidneys, spleen, liver, intestinal contents, which were black and slightly *alkaline*.

Results.—The cultures of the blood, of the renal, splenic, and hepatic pulps, remained absolutely sterile. Cultures of the urine contained some colonies of micrococci, but I must add that the patient was catheterized several times at the hospital.

The cultures of the contents of the bowels taken, as usual, from different points, presented only common microbes.

Remarks.—This seems to have been a genuine case of yellow fever, but the pathogenic *bacilli* had disappeared from the intestine when death supervened.

Obs. VII.—*Nov. 14.* Case due to the courtesy of Dr. Kenworthy. Man, thirty years of age (black), living in the swampy locality of South Jacksonville. The day before, twenty-two hours before succumbing, he had a violent chill, followed by a very high fever (109° F., axillary). A few days before, he had a slight indisposition but recovered.

Autopsy at 4 o'clock in the evening, one hour and a half after death. The liver seems normal, the heart also; kidneys very congested, spleen moderately hypertrophied; urine very albuminous. The intestine contained a whitish matter moderately abundant, alkaline, and the stomach a small quantity of slightly colored liquid. No congestion.

Cultures made with blood, spleen, liver, and intestinal matter. It was not possible to obtain urine.

Results.—The cultures of the blood, of the kidneys, of the spleen, and of the liver, remained sterile. The cultures of the intestinal contents were strewn with colonies almost exclusively composed of large and long bacilli, which did not dissolve the gelatine. Their colonies grew at the surface of the plates, with the aspect of a light pellicle, more or less irregular, and in the interior of the medium of the culture they were regularly spherical.

Remarks.—This seemed to have been a case of pernicious fever; albuminuria is observed in those fevers, as well as in the grave form of bilious fever, and in yellow fever; this symptom cannot, consequently, be used as an absolute criterion for the diagnosis. The indisposition which preceded a few days before, was likely a slight form which appeared before the fulminant access. It is not usual to see yellow fever striking down so suddenly its victims.

Now what is the value of the long bacillus found in the intestine? I cannot tell at present. I report the fact, only, with the hope it may guide some other researches.

After having related the preceding observations, it remains to draw some deductions from them. At first, I recognize that the number of my bacteriological analyses, in this second series, is very limited, especially if we consider that, of the five, I have hardly three undoubted cases. However, is it not remarkable to see that of these three cases (*Obs. III., V., VI.*) that in which death was more rapid (four days, in *Obs. V.*) was the one in which the intestine contained the black and characteristic matter, and presented, in such an extraordinary abundance and almost exclusively, the same bacillus which I have seen in several yellow fever subjects in Havana?¹

I recall the fact that I discovered this microbe first in some Spanish soldiers who died with yellow fever in the military hospital of Havana, and, several months after, in some foreign sailors who succumbed to the same disease in the civil hospital of the same city. I did not find it in subjects dead with other diseases in the latter hospital. Now, after a year, I find it again, as it were, in the state of a pure culture, and in great abundance in the intestine of a subject who presented the symptoms and lesions of genuine

¹ After my first investigations had been published, Dr. G. M. Sternberg also found the same bacillus in three cases of yellow fever in which he looked for it. (*Vide Cronica Med. Quirurg. de la Havana, June, 1888.*)

yellow fever, and this in Florida, at Jacksonville, several days' journey from Havana.

I recall, also, that the cultures of this bacillus exhale an odor quite similar to that which I have remarked several times in black vomit; also, that its biological qualities are entirely in accord with the physiology of yellow fever itself, and in certain conditions I exposed formerly, it blackens the bodies it comes in contact with, so much so that some liquid cultures have the appearance of the matter of black vomit. But I am far from pretending, although it has been claimed, that the last character, no matter how suggestive it may be, is pathognomonic. Of course, my attention was attracted by this melanogenous property—which, however, does not always appear—but I was, above all, struck by the very considerable quantity of the bacillus in one of the first cases I analyzed.

Thus, I think I am right in saying that the presumption that this bacillus is the cause of yellow fever tends to become a certainty.

Besides, I must notice that in the cases in which autopsy took place early after death—as well in Havana as in Jacksonville—the blood, the liver, the spleen, and the kidneys have been constantly found free from microbes. This fact strengthens the theory that I have supported, viz., that yellow fever is an intestinal infection which must be treated *from the very beginning* with the evacuates and disinfectants of the intestines, as bichloride of mercury, naphthalin, and tannic acid.

However, two objections may be presented, which I must answer: How is it that the microbe, supposed to be pathogenic, is not found in every case after death, and, if it has disappeared, how shall we explain the persistence and the aggravation of the accidents? Secondly, if yellow fever is a disease, the germ of which grows exclusively in the intestine, how shall we explain albuminuria? Let us examine the facts.

We do know that when a microorganism has saturated any medium of culture, its growth stops. If another microbe is introduced, and grows in the medium transformed in that way, the first often disappears. This could explain the possibility of the disappearance (at any variable moment) of the microbe of yellow fever. I propose, at the very first opportunity, to analyze the dejections of several patients from the first day to the last. I should not be surprised to find my microbe only in the first period of the disease, at least in a certain number of cases.

As to the persistence, and eventually the aggravation of the accidents, they, in all probability, depend upon the more or less grave import of the lesions. The latter are due to the poisonous products, to the ptomaines secreted by microbes and absorbed by the

bloodvessels of the intestine, and more especially by the radicles of the vena porta.¹ We know that though the microscope and the cultures show the absence of bacteria in the liver, this gland, into which the blood of the vena porta first flows, undergoes, nevertheless, a fatty degeneration analogous to the one observed in certain cases of poisoning *per ingestis*. The spleen, on the contrary, is of normal appearance, unless there is malarial complication or secondary infection. And, if the kidneys are congested and give passage to albumin, it does not mean that they are directly attacked by the bacteria; in typhoid fever, for instance, which may be considered as an infection primarily intestinal, albuminuria is observed without finding in the urine, at least in the beginning, the specific bacillus so easy to ascertain otherwise. Certain kinds of poisonings, also, produce albuminuria (lead, phosphorus, cantharides, etc.).

Before finishing, I desire to remark that in my examinations I have ascertained that the contents of the intestine were alkaline or neutral; they were more decidedly alkaline in Case V., in which my bacillus was so abundant. I believe that the coloring matters contained in the intestine must contribute to induce observers to commit many an error on this subject; these matters color the test-paper yellowish-red, but they do not always discolor the same chemically. I do not pretend, however, that the intestinal contents might not prove acid (but then my bacillus would have disappeared from the intestine).² I once observed, in the civil hospital of Havana, on a subject who died from a mitral affection, that the intestinal contents were clearly acid, whilst the liquid contained in the stomach was alkaline. The post-mortem was performed an hour, or two at the most, after death.

It would be of the greatest interest to continue these researches. The experiments I have made on my bacillus have already given the explanation of the fact that yellow fever remains endemic on the seashore of hot countries and not in the interior; and of this other fact also, that an infected vessel may hibernate in glacial regions without losing the property of communicating yellow fever when she returns to a hot zone.

Other experiments, which I intend to publish later, induce me to think that, if the bacillus in question is really the cause of yellow fever, it would not be impossible to protect against that terrible disease the populations of the countries exposed to the epidemics.

¹ As in poisoning by venomous mushrooms, notwithstanding the evacuation of the ingested substances, the visceral lesions are produced, and sometimes cause death.

² This bacillus does not live in an acid medium. This may be another cause of its disappearance from the intestine.

A CASE OF ADDISON'S DISEASE.

REPORTED BY R. W. GARRETT, M.D.,
PROFESSOR OF ANATOMY, ROYAL COLLEGE PHYSICIANS AND SURGEONS,
KINGSTON, ONTARIO.

OWING to the rarity of this disease it is very seldom an opportunity is afforded for observing the clinical history of a typical case; and it is still more rare to be able to follow up such a history with an autopsy. Under the circumstances I thought a publication of a synopsis of notes taken by his medical attendant and myself, together with the results of the post-mortem and microscopical appearances of the structures involved, would prove interesting as well as instructive.

M. D. S., aged thirty-four, five feet seven inches high, married, of a stout, strong, athletic build, muscles highly developed, chest broad and deep, and other appearances of an unusually well-proportioned young man. Family history excellent. As a child, he always had good health, having had no serious illness, except the usual diseases of childhood. During his early years he superintended his father's farm, but for the past six years he has been manager of a large sash and door factory. Up to the beginning of last July his health was excellent and with few exceptions was always able to attend to all the duties such a large concern would require of a manager. In addition he was a member of rowing, base-ball, and foot-ball clubs in each of which he took an active part, and for which his athletic build made him exceptionally fit.

Three or four times in the last few years he had an attack of diarrhoea with colicky pains lasting two or three days but in the intervals the bowels were quite regular. Nearly a year ago he had an attack of migraine for three days. Last June as an officer in the active militia he went to Gananoque, where in company with his battalion he camped for twelve days. During that time I had daily opportunities of seeing him, and I frequently heard him say that he felt remarkably well, that he had an enormous appetite, and his only trouble was constipation.

On July 2d, in the absence of his physician I was called to attend him for a mild attack of typhlitis lasting a few days and terminating in a copious diarrhoea. It was at this time I noticed a peculiar color in his face, a dull brownish look, but attributed it to the sunburn acquired at camp; I also noticed a weak pulse out of all proportion to the severity of his late illness.

Subsequently he picked up considerable under tonic treatment, but never regained his natural color. About the middle of August he was seen again, when he complained of weakness and disinclination for doing any kind of work; his face and hands were still discolored, eyes rather sunken, pulse small and weak, otherwise he seemed to be in good health.

These symptoms became intensified as time went on and, in addition there developed a restless, nervous condition.

On September 30th, in consultation, his case was carefully investigated and from notes taken I ex-

tract the following: body well-developed, muscles large but flabby, abdominal wall thickened; brownish discoloration of face and neck terminating abruptly above where the hat sheltered the forehead and below at the upper margin of the collar. Pigmentary deposits, irregular in outline, were also found in the right iliac region where sinapisms had been applied during the attack of typhlitis, also on the genitals, particularly the dorsum of the penis; the backs of the hands were also discolored while the palms were a light yellow tinge terminating abruptly where the coat-sleeve covered the wrist. With these exceptions the skin over the whole surface of the body was natural in color and feel.

The eyes were dull and lustreless, somewhat sunken, without pigmentary deposits, the sight normal. The tongue was clean; the mucous membrane of the mouth was of the ordinary color without any discoloration; the lungs perfect; the heart remarkably feeble in action, the systolic sound being almost wholly valvular. Abdominal palpation and percussion gave negative results; pulse 100, weak, small and irregular; appetite poor, capricious, and there were frequent complaints of nausea but no vomiting. Absence of any appearance of oedema. Marked depression and enfeeblement of the nervous system with restlessness, the patient remaining quiet scarcely a moment; profound asthenia, out of all proportion to his general condition, with a tendency to faintness on sitting up. His favorite position was on the back, knees drawn up, the calf of one leg resting on the knee of the other, the position of the legs being reversed every five or ten seconds; great lack of energy both mental and bodily; feeling tired on the least exertion; loss of memory, particularly of recent events, for instance, he could not give an account of his symptoms—if asked if his bowels had moved that day would say "let me see," then would try to think, and in all probability would in a moment or two start to talk about something else, in fact, he could not recall any recent event without a distinct effort. Bowels regular and natural; urine normal.

During the remainder of his life (two weeks), the symptoms became intensified, except the bronzing which, in the opinion of all those who saw him, became lighter in shade. On the morning of the 13th of October, he had an attack of syncope which was overcome by hypodermatics of stimulants. The same evening, after a fairly good day, suddenly profound prostration set in, total inability to stir the body, or even move a finger; the extremities became cold, the wrist pulseless, and at 12.30, of the morning of the 14th, after swallowing a few drops of brandy and milk he expired from cardiac asthenia. His intelligence remained clear up to the moment of death. Duration of the disease three and a half months.

The treatment throughout was purely symptomatic, tonics at first, particularly quinine and nitro-hydrochloric acid. The nausea was always relieved by bismuth and cerium, and the attacks of hiccup he always checked by eating a few cold grapes. Stimulants did harm, increasing the restlessness and nausea. Any kind of a purgative caused profound depression. Twenty grains of potassium bromide with five grains of

Dover's powder always gave a quiet refreshing sleep, lasting throughout the whole night and well into the next forenoon; in fact, this combination acted like a heavy dose of a narcotic.

He became tired of every kind of food, except buttermilk which he drank in large quantities, always, he said, relieving the thirst and nausea.

In regard to the cause, there is none known, nor anything to which the disease might be attributed. It might be mentioned that six years ago he was thrown from a horse and fell on his back. Three years later an abscess formed in the region in which he sustained the injury. It was evacuated; healed up rapidly, leaving a depressed scar.

In company with Hon. Dr. Sullivan and Dr. Oliver, the attending physician, I conducted the post-mortem examination, and to Dr. Sullivan, who made copious notes, I am indebted for the following:

Autopsy, twelve hours after death, revealed marked rigor mortis. The body was muscular and well-formed, without the slightest evidence of emaciation. The only mark was a large circular, depressed scar over the right kidney, which marked the site of a former abscess. The bronzed color on the face, hands, genitals, and right iliac region had changed to a lighter shade.

The opening incision showed about one and a half inches of fat in the abdominal wall; the muscular tissue was healthy and well developed. The subperitoneal fat was abundant, and the omentum well covered with adipose tissue. The liver darker in color but normal in density and volume; the gall-bladder empty, contracted, and diminished in size. The spleen was somewhat enlarged, the pancreas and duodenum normal. The stomach was empty, shrunken, but healthy in structure. The small intestine was somewhat narrowed and slightly congested in parts; partially filled with liquid. It had a general bronzed appearance, very marked in some portions of the ileum, looking as if stained with bile, but contained much less flatus than usual.

The large intestine was healthy; there were some adhesions around the cæcum, indicating a former typhlitis, but the vermiform appendix was congested, firmly adherent to the caput coli, and diminished in size nearly one-half.

The suprarenal capsules were readily detected by their size and hardness, and were, along with the kidneys, carefully dissected out, together with a portion of the aorta. The kidneys were normal in size, the capsule peeling off readily, and on section were dark purple in color, but in no way affected in structure. The right suprarenal capsule was more than three times its normal size, irregularly nodular, and containing a substance arranged in compartments, having a uniform grayish-white, caseous appearance. The investing membrane was thick and dense. The left capsule had increased in size in a vertical direction, was harder, and had, in addition to the caseous masses, firm nodules, cutting with much resistance, and feeling almost like cartilage.

There was much fibrous thickening in the neighborhood, extending to the solar plexus, semilunar ganglia, origin of superior mesenteric, and aorta. This fibrous new-formation surrounded the coeliac axis in a matted mass, narrowing the lumen of its branches, and when removing this mass with the aorta the nerves of the sympathetic could be seen like strings of catgut extending through it. Extending upward, the matting could be traced along the aorta toward the arch, but not downward.

Some few mesenteric glands in the neighborhood of the suprarenal capsules were enlarged, somewhat softer than natural, but macroscopically had no appearance of caseous degeneration. Except as stated, the peritoneum was healthy, not the slightest appearance of fibroid degeneration. Peyer's patches and solitary glands showed no changes.

A noticeable feature of the autopsy was the almost entire absence of blood; the vena cava, and other large bloodvessels were freely divided, but a small napkin was more than sufficient to keep the parts clean during the lengthened examination; the peritoneal cavity was more than naturally dry.

According to promise made to friends who granted the autopsy, the thorax and cranium were not opened, and for the same reason no extensive dissection was made of any of the abdominal organs.

Dr. Clark, superintendent of the Asylum for the Insane, kindly prepared and mounted several microscopical specimens taken from the right capsules, and from his notes I have extracted the following:

When the diseased organ was cut across, the grayish material formed the chief part of the mass, and there were scattered throughout this yellow masses larger than peas. Cretaceous particles were also apparent when the specimen was being prepared. Sections from the gray part showed it to be made up of irregular cells held together by a fibrillated structure. In the yellow bodies the fibrillæ were not apparent, the mass being made up of granular matter and degenerated cells.

52 JOHNSON STREET, KINGSTON, ONT.
December 1, 1888.

RESUSCITATION AFTER APPARENT DEATH.

BY A. H. P. LEUF, M.D.,
OF PHILADELPHIA.

WHEN a cell or number of cells die, it is called a cellular death. When the body as a whole has ceased to act, it is somatic death. Somatic death is a fact when, what Watson has appropriately called the "tripod of life"—i. e., the brain, heart, and lungs, no longer functionates. At this time, cellular death has only partly occurred. In warm weather, as on a hot midsummer's day, cellular life may continue for hours after somatic death. Especially is this the case in sudden death.

The distinction between somatic and cellular death is of the utmost importance, and should always be in the mind of the physician. It explains the resus-

citation of so-called dead persons. There is a case on record of a man lying in the sunshine at the bottom of a small, quiet, shallow stream for fully half an hour before he was taken out, and efforts made at resuscitation, which proved successful at the end of several hours' unrelenting labor.

Dr. Jerome Walker, of Brooklyn, was once called to attend a child suffering with diphtheria. It died while he was present. Consciousness was gone, the heart and lungs had ceased to act, the pupils were dilated, and, in fact, the child was a corpse. He tarried for a moment, and then left for his office, whence he returned with a faradic battery. This he applied to the pneumogastric nerve and chest muscles. Fully twenty minutes had elapsed since the death of the child and the beginning of the electrical application. After a while his efforts were crowned with success, for there were a few gasps and a flicker of the heart, but the officious and ignorant relatives compelled him to desist, and the child passed away into complete cellular death.

Probably one of the most remarkable of this class of cases is one which occurred in the practice of the late erudite and philosophic Dean of the Long Island College Hospital, Professor Samuel G. Armor. I record it, as I had it more than once from his own lips.

The patient was a well-to-do man with wife and children. He had purchased a pain-relieving remedy of a travelling quack. Its basis was cannabis Indica or Indian hemp. He swallowed an overdose, taking it in drachms instead of drops. In time he developed all the symptoms of narcotic poisoning. In spite of all efforts on the part of the attending physician he died. The grief-stricken wife and children wept at the bedside of the dead man. Dr. Armor was present, and at that time was Professor of Physiology in one of the Western schools. At last all left the death-chamber, except Dr. Armor and a negro attendant.

Looking out of a window the doctor mused for some time over the sad ending of his friend and benefactor, for such he had been, and came to the philosophical and scientific conclusion that his friend was somatically dead, to be sure, but that cellular life must still be active, for the room was warm. He thought that if the respiratory and circulatory functions could be maintained by external influences till enough of the poison had been eliminated by the cellular activity, the patient might still survive.

Dr. Armor stated to me that, if required, he would solemnly swear that the shortest possible time that could have elapsed from the time that death was declared until he concluded to make efforts at resuscitation, "*was at least one hour.*" In this estimate he allowed for all the circumstances that might cause time to be overestimated, and felt certain, in his own mind, that he had fixed the time at less than it had actually been.

Bottles of hot water were applied to the limbs; hot water, red pepper, and whiskey were injected

into the bowel, and the same poured into the stomach. Artificial respiration was begun. When the Doctor tired, the negro relieved him, and so they alternated. Occasionally a stethoscope was employed to detect a possible heart-flutter. All was of no avail. After two hours' effort, the body continued lifeless. Hope had fled. The negro, however, continued while the Doctor rested. The desire to save his friend, if possible, and the scientific aspect of the question that had been raised, caused a renewed attempt. More injections were given, and more hot bottles were applied.

More than three hours had elapsed, and again was the attempt abandoned, and once more vigorously made. After nearly four hours of hard work, and when about to desist for the third time, Dr. Armor thought he detected a slight movement of the lips. Soon, again, he was quite positive that he saw it. Again he noticed it after a long interval, and then was certain of returning life. The stethoscope discovered an occasional light, muffled sound over the heart. More injections were given, and efforts at artificial respiration were redoubled. At last the gasps became pronounced, the heart-beats more frequent, the respiration deeper and more regular, until, eventually, respiration and circulation were reestablished, but at a slow rate. Consciousness was not regained for hours, but eventually it returned.

Dr. Armor's description of his own feelings, and those of the family, and negro at this time may be better imagined than they can be told. The patient was alive and well over a score of years afterward; in fact, he was alive and well but a few years ago, and prominently interested and well known in New England financial and banking circles.

These cases teach the difference between somatic and cellular death, and demonstrate that when "life" is extinguished by a sudden interruption of the functions of the brain, heart, and lungs, without any organic change, there is hope for recovery if proper efforts are made and persevered in, for hours, if necessary.

The intelligent practitioner will always bear in mind the distinction between these two kinds of death. Just as we have so-called functional diseases which are not accompanied by any known or detectable lesions of structure, so, also, do we have functional somatic death without structural lesion. In all such cases it should be our duty as physicians to attempt the return of "life" until there is undoubted evidence of cellular death; for instance, rigor mortis would seem to be a reliable sign, judging from the present state of our knowledge on the subject, though coming investigation may show that even this is not necessarily a positive death accompaniment.

There can be no doubt about there being a number of deaths annually that could be prevented by persistent efforts at resuscitation. It seems to me that there is no more imperative indication for the necessity of

persistent efforts at resuscitation than the knowledge or belief that "death" is due to the cessation of the gross bodily functions without structural lesions. In all such instances efforts to bring back life should continue till there is positive evidence of death in the full sense of the word, and this I should consider proven after the appearance of *post-mortem* lividities and *rigor mortis*.

Many cases of the kind that I have mentioned could be adduced, but a few should be sufficient.

A proper question is as to the different modes of exciting the heart's action; among the many methods being Corrigan's button, heat and cold to the epigastrium, cardi-puncture, intracardiac injections, hot and cold douche and immersion baths, and flagellations.

129 S. THIRTY-SIXTH STREET, PHILADELPHIA.

MEDICAL PROGRESS.

The Treatment of Acute and Chronic Tonsillitis.—On Dec. 4th SIR MORELL MACKENZIE visited the throat clinic at the Edinburgh Eye, Ear, and Throat Hospital. He examined a number of patients, and in the course of a short clinical lecture made the following remarks:

"There are two forms of acute tonsillitis, the superficial and the deep. All of you must be well acquainted with these familiar diseases, but perhaps you will like to hear my experiences of the treatment. The superficial is not very serious. It is, however, painful, and it is apt to recur. A person who has had it once is very likely to have it again. This is true of both forms of tonsillitis, but it is particularly so of the superficial. The interior of the follicles becomes inflamed and secretes an unhealthy mucus, and they never thoroughly recover. In all inflammations of mucous membranes the membrane does not really get well, though it may appear to do so. A celebrated French surgeon has said that he does not believe that a person ever really recovers after a gonorrhoea. This is true of the follicles of the throat. A person who has once had acute tonsillitis never really gets well, though he may appear to do so. The treatment, therefore, is important. One of the most popular remedies is aconite—originally, I believe, a homœopathic drug, but now used extensively by allopaths (though I object to the term)—and strongly recommended by Dr. Ringer. It has certainly never, in my hands, proved to be of the extraordinary value which he asserts. On the other hand, I have found guaiacum, which used to be given in the form of the ammoniated tincture, very efficient. I recollect a Manchester surgeon, Dr. Crompton, who used to come a good deal to the Throat Hospital about the time it was founded, telling me I should find much more benefit by giving it in the form of a powder; and I did so, letting the patient take a pinch of the resin. This was rather disagreeable, and after a time I had it made into lozenges containing about three grains in each. In this form it makes an excellent remedy. Nine cases out of ten will get rapidly well if one of these lozenges is given every two hours at the outset. I sometimes also apply locally a little bismuth and opium, or an eighth of a grain of morphia with a quarter of a grain of starch,

because the problem is not only to cure the patient, but to keep him comfortable till he is cured. Sometimes the guaiac causes a little diarrhoea, which is not altogether disadvantageous, but the morphia is usually sufficient to check it. What I have said about guaiac applies to acute inflammations of any part of the back of the throat. Dr. Home has said of guaiacum, "*Instar specifi in hoc morbo operatur.*" It is really specific. I have used it for fully twenty years, and I assure you it is one of the best remedies you could have. It causes a slight stinging sensation, and this is an additional reason for using the morphia.

"Occasionally this superficial or follicular tonsillitis if not checked passes into the deep or parenchymatous form, and the structure of the gland becomes very much affected. When the deep inflammation occurs you must bring it to an abscess as quickly as possible, and open it. Trousseau has pointed out that some inflammations *begin* in the deep part of the gland, and these you cannot check, as a rule, though you may sometimes succeed with guaiac. I have done so in two cases lately. We are usually, however, called in too late. When you find you cannot stop the disease, give inhalations of benzoïn, hop, or conium, and apply poultices to the outside of the throat. Directly you can find fluctuation, make an opening. As the tonsillitis develops it prevents the patient opening his mouth, and there is sometimes difficulty in getting at the abscess. This is the reason why surgeons sometimes have to let the abscess burst, but this should be avoided, if possible, because it has been followed by dangerous and even fatal hemorrhages. I generally use a curved and guarded bistoury, of which only the last quarter of an inch has a cutting edge, but an ordinary bistoury, the greater portion of the edge of which is covered with diachylon, may also be used. The incision is made with the cutting edge directed inward to the centre of the mouth. You must never cut outward, for there is then the danger of wounding the carotid. I would recommend you to incise in cases in which you may not be quite certain of fluctuation. A slight puncture, even if pus is not evacuated, does no harm. The use of leeches was at one time common, but Louis the French physician proved that they did not cut short the disease by more than one day, and therefore their application was not desirable. Leeches have the effect of increasing the inflammation rather than otherwise if less than six are applied.

"Chronic tonsillitis, or hypertrophy of the tonsils, proceeds from two causes. A large number of the cases are the result of a low form of inflammation occurring in childhood. The structure in childhood is very prone to become inflamed. If the tonsils are considerably enlarged, it is important to remove a portion of each. You should never speak of "cutting out the tonsils," as this sounds very alarming to the patient and his friends. Say that you mean to remove only "the diseased and enlarged portion." It is a consideration when you should do this. How much enlargement should there be before the operation is performed? First of all, the question of size is entirely relative. In a large throat the tonsils may grow to a considerable size, and the patient still do quite well. In a smaller throat this would not likely be the case. If the tonsils touch each other, you can have no doubt as to the propriety of taking away a piece. If adult patients come to you with the tonsils slightly enlarged, it is an

important question whether you should cut off a portion or not. If the enlargement is associated with frequent attacks of acute inflammation, you ought then to cut away a piece. There is another condition which requires a similar proceeding. When the follicles of the tonsil are much enlarged, you cannot cure it except by taking off a section, which may be not more than one-eighth of an inch thick. You thus clear away the walls of the deep follicles and get a flat instead of a "worm-eaten" surface.

"As to the method of operating, many surgeons do it with a bistoury, and Sir William Ferguson, a great surgeon, for whom I had the greatest admiration, used to perform it in this way, but it was terrible to see the patient struggling with the mouth half-full of blood before the operation was completed. Great surgeons will do all they can with a knife instead of what they call a "machine." I always perform the operation, however, with "a machine," a tonsillotome. The particular form I use is a modification of Physick's. The great advantage of this is that its mechanism is quite simple, and my modification enables the handle to be fixed on either side of the blade, so that the operation may always be performed with the right hand if the operator desires. As a general rule, lightness of touch is the chief desideratum in operating, but in tonsillotomy it is the reverse. Heaviness of touch is the important thing. The tonsillotome must be pressed well over the tonsil, which is also to be projected into it by pressure with the left thumb placed under the angle of the jaw. I once had a colleague who could do very little else, but he took off tonsils marvelously, and as I watched him I observed that it was this heaviness of touch that made him so successful. If you do not attend to this, you will not take off nearly so much as you desire. Patients have come to me a week or a fortnight after the performance of the operation by another surgeon, saying that the tonsil has been removed but has grown again! This, of course, means that enough was not removed at the operation. It is most important to take off enough.

"Hemorrhage from this operation is rare, but it has occurred, and the carotid in some instances has had to be tied. I once had a serious hemorrhage to deal with some twenty-five years ago. The usual styptics, and even the cautery, failed to relieve it. At last I tried a remedy which I have used ever since with perfect success. A chemist had informed me a short time before that a small quantity of gallic acid would prevent tannic acid dissolving. I mixed two parts of the tannic and one of the gallic in a little water, and gave the patient two teaspoonfuls, telling him to sip them slowly. The bleeding stopped almost at once. We have since used the same preparation at the Throat Hospital, and always with perfect success. The patient must be told to *swallow* the liquid, not gargle. Application with a brush will do no good. He should swallow the fluid slowly, as if it were difficult to get it down, and must on no account wash out his mouth or gargle."—*Edinburgh Med. Journal*, Jan. 1889.

Puerperal Mortality.—During recent years the mortality attending childbirth has shown a steady decrease, so that the maternal death-rate has fallen from the ten to fifteen per cent. of some years ago, to almost *nil* at the present day. Puerperal septicæmia, once the dread of

the practitioner, is now gradually but surely being stamped out, and in the not distant future we may hope to see the mortality from this class of case reckoned, not by the fraction per cent., but by the fraction per thousand. The introduction of antiseptics into midwifery was indeed a very great stride, but it is to the more effectual carrying out of this system, and to its more perfect elaboration, that further and more brilliant results are to be looked for in the future. Epidemic outbursts of puerperal septicæmia have been greatly diminished, owing to improved hygienic surroundings and the introduction of antiseptics; whilst, if septicæmia should occur, our improved methods of treatment render the disease more tractable and less to be feared.—*British Medical Journal*, December 29, 1888.

Antiseptic Pastilles.—DR. ROTTER, of Munich, after numerous careful investigations to decide which antiseptic would be best adapted to the disinfection of the hands, has concluded that the following compound answers all purposes:

R.—Sublimate	. . . . .	$\frac{7}{8}$ grain.
Carbolic acid	. . . . .	30 grains.
Chloride of zinc	} aa	77 "
Sulpho-carbolate of zinc		
Boric acid	. . . . .	45 grains.
Salicylic acid	. . . . .	9 "
Thymol	. . . . .	2 "
Citric acid	. . . . .	2 drops.

This compound dissolved in two pints of water has the same antiseptic properties as 1 : 1000 sublimate solution, which properties it even retains if the sublimate and carbolic acid are omitted.

The author has succeeded in converting this compound into tablets, each containing the quantity and amount of the ingredients mentioned. They are easily soluble and would seem to answer all purposes, the author having made use of them in twenty-seven surgical and twenty-six gynecological cases with the most gratifying results.—*Münchener med. Wochenschrift*, December 18, 1888.

Rhus Aromatica in Atony of the Bladder.—Rhus aromatica, the fragrant sumach of the United States, is recommended by several French physicians as a valuable remedy in cases of incontinence of urine, and in atonic conditions of the bladder and its sphincter. Children from two to six years old may take ten drops night and morning, and older children fifteen drops for a dose. The tonic effect of the medicine does not always persist, but the trouble is liable to return when its use is suspended. It may be given in simple elixir.—*American Druggist*, January, 1889.

Treatment of Sycosis.—DR. GEORGE THOMAS JACKSON, in a paper on this subject read before the New York Dermatological Society, November 27, 1888, concluded that from a number of cases which came under his observation, the following treatment yielded the most satisfactory results:

In acute cases in which there is much pustulation, epilate or curette, and apply boric acid ointment, or Lassar's paste with salicylic acid. Give one-tenth of a grain of calcium sulphide in fresh tablet triturates every one or

two hours. If an acute outbreak of pustules occurs under it, stop it until a subsidence of the eruption takes place, and then begin again.

In subacute cases in which there is not so much pustulation, but more redness, and the disease is more patchy, epilate or curette and use Bronson's ointment, or one of sulphur or tar, or other mild stimulant. Or use soap frictions, followed by protective ointments.

In chronic cases, epilate or curette, or apply a solution of caustic potash carefully to diseased parts. Locally, employ strong ointments or solutions of tar, provided caustic potash has not been used. If caustic potash has been used, then apply a simple soothing dressing. The use of tar in alcohol, as proposed by Pick, of Prague, has of late given brilliant results in Jackson's hands in some cases of chronic eczema, and in the last few days has greatly benefited one of the cases here reported, one which had shown itself to be very obstinate. Soap frictions are also valuable at this time. As chronic and subacute cases may take on acute forms under stimulating treatment, we must be prepared at any moment to apply more soothing methods of cure according to indication.

For the best effect from our local treatment we must insist upon our remedies being kept constantly applied during day and night. To the same end the patient is to be advised to shave himself about twice a week. This is not absolutely necessary, but facilitates the action of the application upon the diseased skin. If a rhinitis be present, appropriate remedies must be used for that.

While treating the skin affection we must not forget the man whom the skin clothes. We must address ourselves to the task of regulating the diet and general hygiene of the patient, and give medicine, if needs must, upon the same principle as we would if the patient came to us not for his syphilis, but on account of his poor general condition.—*Journal of Cutaneous and Genito-Urinary Diseases*, January, 1889.

Mercurial Inunction in Typhoid Fever.—Three years ago a short account was given of a method of treating typhoid fever which DR. KALB, of Thalmassing, had found very successful in one hundred cases in which he had tried it, in eighty per cent. of the cases fever entirely disappeared within ten days. The treatment consisted of rubbing one gramme (fifteen grains) of mercury ointment into the abdomen on the first day, into the inner aspect of one thigh on the second day, and on the third day into the other thigh. The course was repeated during the three following days. Dr. Kalb also gave alcohol methodically, and a few calomel and opium pills on the first day. Dr. Felix Bartlett has published a short paper in the *Australasian Medical Gazette* (November, 1888) in which he confirms Dr. Kalb's statement. He found that the temperature fell to normal in two or three days, and that in five or six days from the commencement of the treatment all other symptoms had disappeared. Both Dr. Kalb and Dr. Bartlett agree also in stating that the treatment by inunction is only of use when commenced before the ninth or tenth day of the disease, and as this is a period when the symptoms are not very distinctive it is possible that, in some instances, the cases submitted to this treatment were only febricula.

The history of one family given by Dr. Bartlett is of special value as affording evidence generally so difficult

to obtain on this head. He says: "In one house a child of four first fell ill. She was not seen by me until the end of the second week. She had a very severe attack, and narrowly escaped with her life. Whilst I was attending upon this case the mother, who was nursing the child, and also two elder children who were in the house, showed undoubted symptoms of enteric fever, with considerable rise of temperature. All three were put under this treatment at once. The symptoms rapidly disappeared, and none of them was in bed more than five or six days. The father next fell ill with precisely the same symptoms, but having to go away on urgent business, refused all treatment. He, however, returned in a few days with the symptoms fully developed, and he ultimately died of the disease. Two servant girls in the house also suffered, but neither said anything about her symptoms until in the third week; one had an ordinary attack, the other a severe one, but both ultimately recovered." In another house, where also the first sufferer was a child, "the mother and the servant both developed decided symptoms, but, being put under treatment, were convalescent in a few days." Dr. Kalb was more cautious in speaking of the early complete recovery of his patients; he found that the spleen remained enlarged for about a fortnight after the fall of temperature, and advised that the patients should be kept under strict observation during this time for fear of a relapse.

It may be useful to recall here that calomel has been lately used, especially in Germany, in the treatment of typhoid fever. Liebermeister has given some striking statistics on this point. He gives the results of 839 cases; 239 were treated with iodine, 223 with calomel, and 377 with neither, the rest of the treatment being exactly alike in all, and consisting in the employment of a partial antipyretic method. Of the cases treated with iodine, 35, or 14.6 per cent. died; of those treated with calomel, 26, or 11.7 per cent. died; while of those non-specifically treated, 69, or 18.3 per cent., died.—*British Medical Journal*, January 5, 1889.

Borax in the Treatment of Diphtheria.—DR. L. NOËL, of Noyers-Saint-Martin, has had considerable success with the following treatment practised by him for the last four years.

Starting with the belief that diphtheria is not a local but a constitutional disease, he sought a remedy which could be introduced into the system in quantities large enough, so to speak, to "crowd out," and not merely modify the action of the poison. The author thus selected borax from all other antiseptics, as bearing administration in large doses without danger to the patients.

In epidemics of diphtheria, the author administered nothing but borax, with but three deaths out of sixty cases thus treated.

The author claims that this agent produces a rapid and abundant salivation; and, in being eliminated by the salivary and muciparous glands of the throat, it softens and detaches the false membranes.

The dose is from 8 to 15 grains in an infant below one year of age; of from 15 to 22 grains for two to five years; of 30 grains for five to ten years; and from 45 to 75 grains for adults, according to the strength of the patient and the severity of the disease. No better results were obtained from 200 grains or over than were obtained

from 60 to 75 grains. The doses are to be equally divided, and given hourly, except during sleep.

In order not to disgust the patient, the correctives in which this salt is given must be frequently changed, as the administration of this medicament must be continued for some time after all symptoms of the disease have passed off, the author having administered it to two patients uninterruptedly for four and six weeks.—*Revue Thérapeutique*, December 15, 1888.

The Obstetric Therapeutics of 1888.—The effect of ergot in involution of the uterus has been studied by Herman, and the results appear to us to demonstrate that the continued use of ergot during the process of involution of the uterus is to be deprecated. Blanc, a French physician, from the observations of the use of this drug in two hundred cases of parturition, arrived at practically no conclusion; if anything, his investigations led him to believe that involution was retarded. Pilocarpine in labor receives attention, but the conclusions arrived at and the deductions drawn are hardly such as to encourage the use of the drug in any of the stages of labor. Cocaine, for the relief of pain in the earlier stages of labor, has been tried, but does not meet with general approbation; and the same may be said of antipyrin, though we are inclined to believe that further trial of this last drug will prove it to be of some service. Silicofluoride of soda, or "salufer," as an antiseptic for intra-uterine or vaginal douches, is highly spoken of, and said to be most efficient. It has the advantage of being "a nearly perfect antiseptic agent," and, unlike the perchloride of mercury solutions, it does not roughen the hands, spoil instruments, or set up poisonous symptoms; while, at the same time, it is a very powerful germicide, and, according to Mayo Robson, a solution of "0.61 per cent. possesses greater antiseptic power for animal tissue than a one in five hundred perchloride of mercury solution."—*British Medical Journal*, December 29, 1888.

Pneumotomy for Pulmonary Abscess.—PROFESSOR F. M. OPENSOVSKY, of Dorpat, relates in the *Vratch*, No. 38, 1888, a strikingly successful case of pneumotomy for an enormous abscess of the right lung, with gangrene, in a man aged thirty. The patient had enjoyed excellent health up to the middle of April, 1886, when, in consequence of exposure, he caught severe pleuro-pneumonia, which ended in suppuration. Three weeks after the onset of the illness he expectorated a tumblerful of offensive pus. The suppuration steadily progressed, being accompanied by violent cough, hectic fever, and emaciation. About the middle of September signs of pulmonary gangrene appeared. Pneumotomy was performed by Professor W. Koch, on September 19th. The patient being slightly under the influence of chloroform, two pieces, each ten centimetres long, were excised from the fifth and seventh ribs, between the anterior and posterior axillary lines. The pleura having been found firmly adherent, a thermo-cautery was plunged into the pulmonary tissue, striking the abscess-cavity at a depth of two or three centimetres; this was followed by cough and the expulsion of a large amount of fetid greenish pus. On placing the man on his right side a tumblerful of pus immediately escaped. The cavity was so large as to allow Professor Opensovsky to introduce his whole hand and freely move it about, searching for the bronchial

opening. Having removed with the fingers several pieces of sloughing tissue, the operator enlarged the bronchus with the thermo-cautery, and then freely cauterized the whole gangrenous focus, afterward washing out the cavity with a weak solution of permanganate of potash. In conclusion, a fenestrated drainage-tube was inserted, and an antiseptic dressing applied. The irrigations were repeated twice daily for the first ten days, and only once a day up to October 26th, when the drainage-tube was removed. The temperature became normal on the eighth day after the operation. In November the wound closed, and on December 8th the patient was discharged, practically well. On re-examination about a year and a half later, a shallow funnel-like depression was found at the site of the operation, with a slight spinal curvature with the concavity toward the right; but the man felt quite well, and was able to earn his living as a hospital porter.

According to Professor Opensovsky, this is about the twentieth case of pneumotomy for pulmonary abscess, and the fourth in which complete recovery has taken place without a fistula being left.—*British Medical Journal*, January 5, 1889.

Iodoform in Diphtheria.—In the Polish weekly *Gazeta Lekarska*, No. 36, 1888, DR. A. PULAWSKI, of Warsaw, details seventeen cases of diphtheria, mostly of a severe kind, rapidly cured by the local use of powdered iodoform, in quantities varying from five to ten grains twice or thrice daily. The drug was applied by means of a brush or an insufflator. According to Dr. Pulawski, iodoform acts as an antiseptic, and represents, generally, the best anti-diphtherial means of all known. The main advantages are said to consist in, 1st, its being absorbed but gradually; 2d, in its application being easy and simple; and 3d, in its manipulation (powdering, insufflation) being free from such dangers as wounding the affected mucous membranes.—*St. Louis Med. and Surg. Journal*, Jan. 1889.

Remarkable Tolerance of Nitro-glycerin.—DR. DAVID D. STEWART (*Polyclinic*, December, 1888) reports a case of chronic parenchymatous nephritis, in a male aged twenty-six, in which tolerance to nitro-glycerin was so rapidly acquired that, a few months after its administration was begun, no dose, short of one which to prescribe seemed hazardous, exerted any appreciable influence on the vascular system. When the case first came under observation there were present slight cardiac hypertrophy with arterial fibrosis; dropsy, scanty urine of light gravity, containing an abundance of albumin and casts. In addition to other remedies, one minim of a one per cent. solution of nitro-glycerin, four times daily, was prescribed. To maintain a constant effect, this dose was directed to be gradually and systematically increased. In less than seven months the patient was taking fifty minims of a ten per cent. solution, four times daily—an equivalent of twenty minims of pure nitro-glycerin in the twenty-four hours, with no more appreciable subjective or objective effect than was originally produced by the initial dose of one minim of the one per cent. solution. His condition has steadily improved. Dropsy has disappeared. The urine has become normal in amount. Casts cannot be found in any of the recent specimens examined, and the albumin has decreased from many grammes to but one per litre.

THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

COMMUNICATIONS are invited from all parts of the world. Original articles contributed exclusively to THE MEDICAL NEWS will be liberally paid for upon publication. When necessary to elucidate the text, illustrations will be furnished without cost to the author. Editor's address, No. 1004 Walnut St., Philadelphia.

SUBSCRIPTION PRICE, INCLUDING POSTAGE,
PER ANNUM, IN ADVANCE \$5.00.
SINGLE COPIES 10 CENTS.

Subscriptions may begin at any date. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made, at the risk of the publishers, by forwarding in registered letters.

Address, LEA BROTHERS & CO.,
Nos. 706 & 708 Sansom Street,
PHILADELPHIA.

SATURDAY, JANUARY 26, 1889.

THE PRACTICE OF OBSTETRICAL ANTISEPSIS BY NURSES.

THE theory of antiseptics in obstetrics has had sufficient trial to give evidence of its practical value, and it is at present more a question of the mode of practising antiseptics than of the value of the method. The education of nurses in America has reached the point where a considerable number of competent women, practically familiar with surgical and obstetrical antiseptics, are graduated from hospital schools yearly. There remains, however, a considerable number of untrained nurses, not familiar with the use of antiseptics, for whose guidance simple, explicit rules are needed. The problem of the application of antiseptic treatment outside of hospitals awaits a complete solution, for nurses perfectly competent when possessed of the apparatus and solutions furnished in hospitals may be puzzled in attempting antiseptic treatment in dwellings.

The rules recently added to the *Manual of Midwifery for Prussian Midwives*, which were published in this country in THE MEDICAL NEWS of last week (page 83), and recent writings and discussions by Ahlfeld, Valenta, and others, afford information of practical value. Of primary importance for nurse, as well as physician, is strict personal cleanliness; the toilet of the hands must be exact, the ordinary clothing clean and covered by a large clean apron. The forearms must be bare and cleansed with the hands; the nurse must carry toilet articles used by her only. German authorities do not, at present,

entrust bichloride of mercury to midwives and nurses; fluid carbolic acid is provided, with a measuring glass and glass irrigator of marked capacity, in which definite solutions are prepared; explicit directions for making solutions and mixing carbolized oil or glycerine are given, every precaution being taken against the possibility of injuring a patient by undissolved acid. The apparatus needed by the nurse is very simple, an irrigator, elastic tubing, suitable canulæ and catheters, with absorbent cotton or jute. The instructions given may be stated in the three simple propositions: strict personal cleanliness; strict aseptic cleanliness for the patient and all touching her; non-interference without positive indications. The last refers especially to vaginal injections, which must never be given without the doctor's order, or the existence of unmistakable indications, which are clearly defined.

The use of bichloride of mercury, so common in American hospitals, cannot be criticised when in the hands of a nurse of known intelligence and experience; in less skilful hands the usage of the German Government is to be commended. Dispensary physicians, and those who assign cases to medical students, may profit by these regulations in instructing those who care for the poor after confinement; in the absence of midwives instructed by the government, such attention to the details of obstetric practice is especially incumbent on practitioners. Dispensaries might easily furnish standard solutions of antiseptics and sterilized cotton or jute, to be used instead of sponges. There is no field of practice in which meddlesome ignorance can do such great harm as in obstetrical practice, and no work in which the faithful observance of the simple axioms of science can obtain such excellent results.

THE BACILLUS OF YELLOW FEVER.

IN another column we have the pleasure of laying before our readers a paper, which was read by Dr. PAUL GIBIER, last week, before the New York Academy of Medicine, describing the results of his researches during the late epidemic of yellow fever in Florida, which were prosecuted under commission from the French Government.

Dr. Gibier found in the intestine in one case the same bacillus which he saw in several cases of yellow fever in Havana in the winter of 1887-8, and which he believes to be the cause of the disease. This bacillus presents many points of resemblance to the

comma bacillus of cholera. He holds that the reason why this bacillus is not found in every case of the disease is because when a culture medium becomes saturated with a microorganism, its growth stops and another microbe then flourishes in the transformed medium, and the first disappears. Therefore, his microbe is likely to be found only in the early stage of the disease, and in the alkaline intestinal contents. A moist heat of 140° F. destroys the bacillus in a few minutes, and desiccation proves fatal to it within twenty-four hours. This last observation, in Dr. Gibier's opinion, explains the immunity of inland districts—the comparative dryness of the air destroying the bacillus.

This same bacillus, we believe, has also been isolated and carefully studied by Dr. Sternberg, who has reached a very different conclusion as to its etiological relation to yellow fever, and in his latest published utterance on the subject (*Transactions of the Association of American Physicians*, vol. iii., 1888) he briefly states his opinion that the specific agent of yellow fever has not yet been demonstrated.

In accordance with the view of Dr. Gibier, yellow fever is an intestinal infection, which must be treated from the onset by evacuates and disinfectants.

STATES MAY REGULATE MEDICAL PRACTICE.

AN interesting decision has been rendered by the Supreme Court of the United States, supporting the right, claimed by the State Board of Health of West Virginia, to make rules for the regulation of the practice of medicine. The statutes of that State enact that every practitioner must qualify himself for legal practice by obtaining from the Board a certificate that he is a graduate of a reputable medical college, or has been ten years in the State engaged in practice, or that he has passed a satisfactory examination before the Board. A practitioner, named F. M. Dent, having been convicted of illegal practice, carried the case up to the State Court of Appeals, and thence to the United States Supreme Court, asserting that the law was unconstitutional, inasmuch as it deprived him of liberty and property without due process of law.

The decision of the Supreme Court says: "The power of the State to provide for the general welfare of its people authorizes it to prescribe all such regulations as may be necessary to secure the people against the consequences of ignorance and incapacity as well as of deception and fraud. One means to

secure this end is the method adopted by the State of West Virginia. If the means adopted are appropriate to the calling or profession, and obtainable by reasonable study or application, no objection to their validity can be raised."

If it is the right of the State under this weighty and memorable decision, to protect its citizens from pretenders and quacks, the duty so to protect them must be found by all diligent State Boards of Health to follow sharply thereafter. This duty to repress ignorant or fraudulent practice does not, of necessity, inhere in a Board of Health—in England, for example, it rests with the General Council of Medical Education and Registration—but it has been found expedient in this country to make the State Board the means for the correction of this form of abuse. In two States, at least, Illinois and California, a considerable improvement in medical practice has been accomplished, and we expect that West Virginia will presently report that her ranks have been purified from the worst of her quackish and ignorant impostors.

We are gratified to chronicle that the Governor of Florida has called upon the Legislature of that State to convene in extraordinary session for the purpose of establishing a State Board of Health and for other sanitary measures. This is a most important step, and has been taken none too soon, for the Legislature will not meet until February 5th, and a considerable time must, of necessity, elapse before the ways and means can be agreed upon and the sanitary machinery be set in motion. It is to be hoped that the law-makers will be as prompt as possible in the adoption of a liberal and efficient charter for this new Board, upon which great responsibilities will rest.

DR. JOSEPH Y. PORTER, surgeon in charge of the Government relief measures, in the early part of the week sent the following official announcement of the completion of disinfection in Jacksonville to Surgeon-General Hamilton in Washington:

"The work of disinfection and destruction of infected bedding is practically finished in this city. It is perfectly safe for any one to visit Jacksonville who may wish to, as the work has been as thorough and efficient as human agency could make it. It speaks for itself that Jacksonville is perfectly clean. Please announce this through the public press, so that the timid may have their fears removed, and that confidence in the city may be restored."

On January 21st, the Auxiliary Sanitary Association tendered Dr. Porter resolutions expressing appreciation of the work done by him at Jacksonville during the past four months, and also presented him with a very handsome gold repeater watch and chain as a souvenir of his stay in Jacksonville. As all his sanitary work is now completed, Dr. Porter has left for Key West, his home.

THE Surgeon-General of the Army, in his report to the Secretary of War, recommends that authority be granted by Congress for the publication of a Catalogue of the Army Medical Museum.

DR. LANDON CARTER GRAY has been elected President of the New York Society of Medical Jurisprudence, and Chairman of the Neurological Section of the New York Academy of Medicine.

DR. W. W. KEEN has been elected President of the Philadelphia County Medical Society.

The Lancet announces that it has founded "*The Lancet Medical Fund*," the object of which is to afford immediate pecuniary assistance in emergencies to medical men, or, in case of the death of a medical man, to his widow or orphans or dependent relatives. The Almoners of the Fund are to be the President of the Royal College of Physicians, the President of the Royal College of Surgeons, the President of the General Medical Council, and the two proprietors of *The Lancet*. The latter will generously place at the disposal of the Almoners a sum of at least \$1500 a year, which will be administered free of cost, and they do this to express their sense of the generous support which the profession has accorded to *The Lancet* during the sixty-six years of its publication.

THE Trustees of the Philadelphia Polyclinic and College for Graduates in Medicine have founded a chair of Diseases of the Mind and Nervous System, and have elected Dr. S. Weir Mitchell to the professorship.

The Trustees have purchased a large property on Lombard Street, above Eighteenth, for \$25,500, which will be adapted to the uses of the institution.

DR. WILLIAM OSLER, Professor of Clinical Medicine in the University of Pennsylvania, will deliver the second annual address before the Society of the

Alumni of the Bellevue Hospital, on Wednesday evening, April 3d, at the Hall of the New York Academy of Medicine.

THE Governor of Illinois, in his annual message, sent in to the General Assembly last week, pays the following just tribute to the State Board of Health: "The wise and intelligent policy of the Board on the subject of quarantine has been of great value to the material interests, not only of Illinois, but of the whole Mississippi Valley. While vigilantly guarding against the introduction and spread of the dangerous, contagious, and infectious diseases, it secures the least interference with commerce and travel, and so averts unfounded panics and prevents loss and interruption of business and industry. During the past few months a striking illustration of the value of this policy was afforded by the action of the worthy Secretary of the Board, who refused to sanction any expenditure of money from the public treasury in the maintenance of quarantine restrictions, which his wide and varied experience and scientific knowledge enabled him to pronounce unnecessary for the State. His firmness in this instance alone prevented the loss of thousands of dollars, besides great inconvenience to travellers and vexatious interference with business; and the example thus set materially helped to check the ruinous and needless quarantine enforced in other States."

LONDON maintains its position as the most healthful of the large capitals of the world. The health-rate of that city in 1888 was 18.5 per thousand, the lowest that it has yet recorded. The *Lancet* of January 5th points out, at the same time, a possibility that the official estimate of the city's population may be too high, since it is now eight years ago that the last census was taken; the estimate for the middle of 1888 being placed at 4,282,921. The birth-rate, 30.7 per thousand, is also the lowest hitherto registered. Zymotic deaths were, as a rule, lower than in recent years; the only exception being those by diphtheria, which were never higher than in 1888. Diarrhoeal causes had an unprecedentedly low rate, owing to the cold and wet summer season of last year.

AT Vienna a beginning has been made of a promising museum of specimens illustrative of medico-legal questions. About 1400 specimens have been gathered, chiefly by Professor Hofman and his assistants, and have been given a place at the General

Hospital, along with other and older collections. Considerable space is given to specimens relating to sexual jurisprudence, the production of abortion, homicide, suicide, the effect of poisons, of burns, the lodgement of foreign bodies in the respiratory passages, the identification of the dead body.

SOCIETY PROCEEDINGS.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, January 17, 1889.

THE PRESIDENT, WM. GARDNER, M.D.,
IN THE CHAIR.

DR. JAMES BELL read a paper on

THE CAUSE AND PREVENTION OF URETHRAL FEVER.

After shortly describing the various theories held as to the cause of this fever, he said that every medical man was familiar with a certain form of constitutional disturbance which follows instrumental or operative interference within the urethra. Preëxisting disease of the kidneys, ureters, or bladder, sepsis, etc., may explain some of the cases, but there still remained behind a large class of cases occurring in male patients of all ages, in which operative or instrumental interference will be followed by a train of symptoms to which have been given many names, such as urethral fever, urine fever, catheter fever, etc. The symptoms occur in four different forms:

(1) Shock, collapse, and death within a few hours after operation, with or without chill or fever, and with partial or complete suppression of urine.

(2) A severe chill with high fever occurring a few hours after operation, and usually following the first act of micturition. Profuse sweating and prostration follow, but the whole disturbance lasts from only a few hours to two or three days.

(3) Recurrent chills and high fever coming on at irregular intervals and lasting perhaps for weeks and months.

(4) A moderate fever with slight chills or chilly feelings, accompanied by great depression, low muttering delirium or semi-coma; patient gradually passing into a typhoid condition, and dying in two or three weeks. Such cases occur in old men with large prostates, especially in those in whom frequent catheterization has resulted in the formation of false passages.

The various symptoms called urethral fever have been attributed to—

- (1) Septicæmia.
- (2) Reflex nervous phenomena.
- (3) Uræmia.

Dr. Bell went on to say that in December, 1883, Sir Andrew Clarke read a paper, before the Medical Society of London, on "Catheter Fever," which called forth a spirited discussion, in which all the leading genito-urinary surgeons took part. No definite conclusions, however, were arrived at.

The reader of the paper stated that a very casual investigation of the subject shows the utter inadequacy of

any of the theories mentioned above. It differs entirely from pyæmia and septicæmia in its symptoms and in the absence of gross lesions; nervous disturbance in no other cases causes such symptoms, and it corresponds to no known form of uræmia.

The discovery of the animal alkaloids, known as ptomaines and leucomaines, and the experiments of Dr. Burchard, of Paris, from 1882-6, upon the toxicity of the alkaloidal substance found in normal urine, seem to give the key to a rational explanation of the origin of urine fever. There can now be hardly any doubt that the disease is due to the absorption of the products of decomposed or decomposing urine from cut, lacerated, or abraded portions of the urethra. It is not a septic process but a form of poisoning closely allied to uræmia and due to the absorption of a toxic alkaloid, produced by or during the decomposition of the urine. The clinical facts in support of this are very strong, and were tabulated by Dr. Bell as follows:

(1) Urine fever is unknown after perineal lithotomy, external and internal urethrotomy in the pendulous urethra, and is far less frequent when the urethra is wounded in its floor.

(2) When, after internal urethrotomy, the urethra and bladder have been carefully washed out with an antiseptic solution, urine fever does not occur until some hours after urine has been passed over the wounded urethral surface, and is then of a mild type and free from danger.

(3) Operations upon the female genitals, which wound or injure the urethra, are not followed by urine fever.

(4) Mr. Reginald Harrison, of Liverpool, has shown by a number of operations that when the bladder is drained by a perineal wound after internal urethrotomy that urine fever never occurs, and he attributes its origin to the absorption of the products of the decomposing urine in wounds of the urethral mucous membrane.

The reader of the paper said that it was primarily with the object of adding his experience in support of this important observation, and his testimony in favor of the combined operation that he brought this subject forward. He related the history of five cases operated on by the combined method during the last few months. In these five cases he drained the bladder by the perineum after having divided the stricture internally, after Mr. Harrison's method. All five cases selected were specially intractable strictures due to traumatism, etc., and situated in the deep urethra, and in several cases the strictures were multiple. All these cases recovered from the operation without a bad symptom, no rigors or fever. In contrast to the result obtained in unfavorable cases, Dr. Bell related six cases of simple stricture which he had treated by internal urethrotomy alone; in four of these urethral fever supervened—in each case after urination.

Dr. Bell drew the following conclusions:

(1) That urine fever is a consequence of the lodgement and decomposition of urine in contact with a wounded urethra, the inference being that the absorption of the product of decomposition which takes place from wounded surfaces, and which could not occur through the normal urethral mucous membrane, is the direct cause of this condition.

(2) Urine fever is *absolutely preventable*, either by providing a dependent drain, so that urine could not lie in contact with the wounded urethral surface long enough

to decompose, or by preventing the decomposition of the urine by drugs or antiseptic injections.

(3) That a perineal cystotomy is a simple and easily performed operation, which does not materially add to the risks attending urethrotomy, and is not followed by unpleasant consequences if the drainage tube be not retained too long.

(4) That decomposition of urine can be delayed for a considerable time by thorough cleansing of the urethra and bladder, and by injections with antiseptic solutions after operation. This, with the precaution on the part of the patient of abstaining from passing urine for as long as possible, will greatly lessen the frequency of urethral fever.

(5) Quinine, aconite, and other drugs may be of use when urine fever has occurred, but they are powerless in most cases to avert it.

(6) Patients with enlarged prostate, who have suffered from laceration of the deep urethra, should be treated by perineal cystotomy at once in order to avert urine fever, which is likely to occur as soon as the patient is able to evacuate urine without a catheter.

DR. RODDICK, in the discussion which followed the reading of the paper, said that many of the cases of urethral fever which formerly were so common were no doubt due to sepsis—sufficient attention was not paid to the cleanliness of instruments. This would, however, not explain all the cases. He agreed with the reader of the paper in thinking that external urethrotomy was the proper operation in cases of severe stricture, but he would not complicate it with an internal urethrotomy. The external operation was not such a simple one as Dr. Bell said it was, he had seen death follow the operation and occasionally a fistula persists. Dr. Roddick had great faith in the administration of quinine and aconite in cases of operation on the urethra and he was convinced that they often prevented the occurrence of urethral fever; he related the case of a man who had been operated on several times by internal urethrotomy. When quinine was given there was no urethral fever, but when its administration was omitted severe fever followed the operation.

DR. SHEPHERD said that he entirely agreed with the views concerning the origin of many cases of urethral fever, advanced by the reader of the paper; these views had been ably discussed and illustrated by Mr. Reginald Harrison, of Liverpool, in the Lettsomian Lectures of last year, and in addition to the evidence offered by Dr. Bell he might add the fact that in cases of enlarged prostate with retention where the patient had been subjected to prolonged and ineffectual attempts at relief by catheterism, and where there was injury to the urethra, no urine fever followed if the urine was drawn off by aspiration above the pubes. He thought, however, that a distinction should be drawn between urethral or urine fever and the so-called catheter fever which followed the commencement of catheter life in old people with large prostate and which often terminated fatally at the end of two or three weeks; here the probable source of the mischief was in the kidneys. Even in these cases rest in bed during the first week and catheterization under ether averted the attack of catheter fever.

Dr. Bell had referred to the internal administration of drugs, and seemed to think that they had no power to prevent an attack of urine fever. This he could not agree

with. He had frequently seen urine fever averted by the administration of drugs, such as quinine, etc., before or immediately after the catheterization or operation. Some held that the individuals thus influenced by quinine had been previously the subjects of malaria, but the fact remained that a full dose of opium or quinine frequently prevented the onset of the fever. In illustration of this a case was cited where on passing a catheter for stricture, when quinine was omitted urine fever invariably followed. Dr. Palmer, of Louisville, Ky., advocates the administration of boracic acid for some days before internal urethrotomy, to sterilize the urine. In forty cases operated on, only one had urethral fever, and in this case boracic acid had been omitted. Dr. Shepherd had no doubt that by giving drugs such as quinine, boracic acid, etc., which were largely eliminated by the kidneys, the urine could be sterilized, and urethral fever averted. He himself was in the habit of trusting to opium and quinine.

DR. T. WESLEY MILLS said that all forms of urine fever could not be reduced to one type. No doubt, chills and fever frequently follow catheterization or operation, but the occurrence of ptomaines in the urine will not altogether explain this, and facts have been adduced to prove this. Irritation will explain some cases; at least this may explain the beginning of an attack, which is afterward aggravated by ptomaines. The normal depends on ingoing influences, and the abnormal on derangement of these. Has opium, quinine, or even whiskey been given before the operation? These lessen nervous irritation. He thought the views advanced too narrow, and broader grounds must be taken.

DR. STEWART asked if urethral fever was not caused by the mere introduction of an instrument, without abrasion.

DR. RUTTAN could not quite agree with Dr. Mills that the group of symptoms known under the name of urethral fever were of nervous origin; he thought that the ptomaines theory was the strongest. The toxic action of normal urine has been long established, and the experiments of Burchard and Gautier go to establish the development of ptomaines in fermenting urine. It is not usually understood why, for all putrefactive alkaloids so far found in urine have the effect of depressing the system, lowering the blood pressure, pulse, and temperature.

The phenomena observed in urethral fever are those of increased metabolism and high temperature; these, then, must be due to some, as yet unknown, constituents of the urine. He could not see why it was necessary to suppose that the urine underwent decomposition in contact with the raw surface of the wound. Gaucher, in some recent experiments, has shown that the extractives normally present in urine, such as creatin, creatinin, xanthin, etc., when introduced into the circulation in minute doses are capable of giving rise to serious systemic disturbance, and, if continued, of inducing an acute nephritis, anuria, and death. Now, as normal urine contains a number of leucomaines or physiological alkaloids of higher toxic powers than creatinin, their absorption might account for some of the phenomena observed. If urethral fever be not due to alkaloids, it is a curious coincidence that those drugs which are most in favor in the treatment of such cases are alkaloids, and many of them physiological antidotes to ptomaines

already worked out. Brieger's toxic neuridin is rendered almost innocuous by aconite, others are counteracted by morphia, atropia, and other drugs employed in urethral fever. The very argument adduced by Dr. Shepherd against urine fever being due to ptomaines is in favor of that theory, for rest in bed is the very treatment to prevent the formation of poisonous ptomaines, these being formed during exercise only. He could well imagine how useful boracic acid would be in such cases, for it is eliminated almost unchanged by the kidneys.

DR. GARDNER asked if the introduction of these alkaloids into the body was attended by high temperature.

DR. RUTTAN said there was no elevation of temperature when these were introduced, which was an argument against the ptomaine theory.

DR. LAFLEUR asked Dr. Bell if the shiver which sometimes accompanies the act of micturition should be looked upon as a form of urine fever, and if not, where were we to draw the line?

DR. BELL, in reply to Dr. Roddick, said he did not perform external urethrotomy, but merely opened the membranous urethra for purposes of drainage. If the tube was retained for only three or four days no fistula could possibly result. He thought the catheter fever of old men was different from the urine fever following operations on the urethra in apparently healthy men. He had treated the subject from a purely clinical standpoint, and had not specially considered its physiological or chemical bearings, and he said that what he regarded as essential to prevent urethral fever was, (1) to prevent the lodgement of urine in contact with a wound of the deep urethra, and (2) to prevent its decomposition in such a situation.

OBSTETRICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, January 3, 1889.

THE PRESIDENT, THOMAS M. DRYSDALE, M.D.,
IN THE CHAIR.

DR. C. P. NOBLE reported

A NEW METHOD OF DIAGNOSIS IN OBSCURE CASES OF ENTERO-VESICAL FISTULA.

He had been recently asked by Dr. C. M. Wilson to see a patient supposed to be suffering from a fistula. It was not his purpose to report the case in full. Briefly, the woman had what is called an ischio-rectal abscess, about five years before. Some time after this abscess discharged she stated that she began to pass wind and small pieces of fecal matter *per urethram*, at irregular intervals. No symptoms of bladder irritation existed. An extensive cicatrix following ulceration produced by a pessary, is present in the vagina. It extends along both sides of the vagina and across the posterior fornix (behind the cervix). In view of the absence of bladder irritation and the well-known haziness of the knowledge of anatomy possessed by the laity, it was thought likely that if the fistula did exist it was a recto-vaginal fistula. A careful examination under anaesthesia by touch and sight made by Drs. Wilson, Hawley, himself, and others, failed to demonstrate the existence of any fistula communicating with the vagina. But two conclusions could be drawn; either the woman was right or else she was a

malingering. The latter seemed probable from what was known of her.

It was suggested that a careful and extended study of the urine, made with the microscope, might determine the diagnosis—particles of vegetable fibre or seed of small fruits might be found. This plan involved much labor and time. It occurred to him that the hydrogen gas test would settle the matter quickly and positively and he suggested that it be employed. The recommendation was accepted and followed the next day. Dr. Wilson forced the gas into the rectum and lighted the gas at the end of a catheter introduced into the bladder. Dr. Noble was unable to be present at the time, but Dr. Wilson told him that no gurgling sound was heard (caused by the gas passing the ileo-cæcal valve), hence it seems plain that the communication exists between the bladder and the large intestine. Dr. Noble offered this as a new and valuable method of diagnosis in obscure cases of entero-vesical fistula: or a new application of Senn's hydrogen gas test.

NEW YORK NEUROLOGICAL ASSOCIATION.

Stated Meeting, January 8, 1889.

THE PRESIDENT, GEORGE W. JACOBY, M.D.,
IN THE CHAIR.

DR. GRAEME M. HAMMOND exhibited a male patient with

TRAUMATIC HYSTERIA.

He had been injured July 11, 1885, by falling upon a sharp-pointed iron rod one inch in diameter, which penetrated into the right submaxillary region about one and one-third inches from the median line. It passed in about four inches in a direction upward, backward, and inward. Dr. Philip Zenner, of Cincinnati, saw the patient a half hour subsequent to the accident, and has described his symptoms in the *Medical Record*. He was then suffering from paralysis of the right arm and leg, right side of the face, tongue, and palate. There was complete anaesthesia of the left side of the face, and loss of taste on the left side of the tongue and of smell in the left nostril. There was intense pain in the region supplied by the middle division of the fifth nerve. He consulted Dr. Hammond for the relief of this pain, and his advice was to excise the middle division of the nerve. The patient was sent by him to St. Luke's Hospital, where Dr. Robert Abbe operated November 16th. The nerve was excised almost to Meckel's ganglion. The next day the patient was again examined. The intense facial pain had disappeared, and the anaesthesia of the two other divisions of the fifth had also disappeared. The senses of smell and taste were restored, and the hemiplegia was markedly improved. At the present time, seven weeks after the operation, there has been no relapse. Dr. Hammond's conclusion was: that although a certain amount of organic lesion was undoubtedly present, yet the fact that so many symptoms were relieved by an operation which would not have affected them at all if they had been produced by a central lesion, showed conclusively that hysteria must be regarded as the sole cause of their production.

DR. C. L. DANA asked if the whole side of the tongue was affected, and was answered in the affirmative. He stated that he had seen the patient previously, and that

the gain in motor power since the operation was little, that there was still considerable loss of power and rigidity. There was no doubt that he had a genuine trauma at the base of the brain, and that he now has an organic lesion upon which some hysteria is superimposed.

DR. FREDERICK PETERSON did not think that a true ankle clonus, such as was obtained in this case, could be obtained in simple and pure hysteria. He had not met with true clonus in hysteria, but had frequently observed what Gowers describes as a spurious clonus, due to a half voluntary contraction of calf-muscles, and which Gowers considers characteristic of hysteria.

DR. B. SACHS believed that an actual clonus is observed in pure functional neuroses at times, and stated that such cases are cited by Oppenheim. He thought the marked hysterical element in this case and the rapid improvement made it possibly one of hysteria. He asked if there were any hysterical symptoms in the previous history of the case, and was answered in the negative.

DR. HAMMOND closed the discussion by saying he thought there was a real organic lesion also in the case, but that the anaesthesia, part of the hemiplegia, and the loss of taste and smell were hysterical.

DR. ISAAC OTT, of Easton, Pa., then read a paper upon the

THERMO-POLYPNÆIC CENTRE AND THERMOTAXIS,

the following being his conclusions from sixty experiments:

1. The thermo-polypnæic centre is situated in the gray matter about the third ventricle, at its anterior part.
2. This centre acts reflexly, so that when heat is thrown on the body the sensory impulses excited by the heat are conveyed to the polypnæic centre, which stirs up the respiratory centre to throw off heat. It stands between heat production on one side and heat dissipation on the other.
3. The fall of the number of respirations by the heat after the removal of the polypnæic centre is due to an excitation of fibres running in the vagi, which inhibit the respiratory centre.
4. The normal temperature of the body is not necessarily dependent upon the amount of heat produced or dissipated, for human calorimetry shows that the heat production varies, but that the temperature remains nearly the same. The relation of heat production to heat dissipation decides the temperature.
5. The cortical centres, the cruciate and Sylvian, are thermotaxic.
6. The four basal thermotaxic centres are situated as follows: one in the caudate nucleus, one in the gray matter beneath the caudate nucleus, another in the gray matter about the most anterior part of the third ventricle, and still another in the anterior inner end of the optic thalamus in the gray matter about the third ventricle.
7. These six thermotaxic centres are more circumscribed than Dr. Gerard, of Geneva, believes.
8. These six thermotaxic centres are neither thermo-inhibitory nor thermo-excitor, but thermotaxic; that is, they maintain the balance between heat production and heat dissipation, so that the temperature is kept normal.
9. In fever neither increased production nor increased dissipation nor high temperature are necessary, but fever is mainly a disease of thermotaxis, a disorder of the four basal thermotaxic centres. It is true in septic fever that

in its initial stage heat production usually runs temporarily ahead of heat dissipation, but, exceptionally, both are immediately diminished.

10. Antipyretics do not necessarily inhibit or excite heat production or heat dissipation, but act upon the thermotaxic centres disordered by fever agents to restore order on normal thermotaxis. Prof. Chittenden's careful researches prove that in healthy hungry rabbits moderate doses of quinine exercise, at most, only a very slight depressing influence on body temperature, and have but a minimum effect upon the production of carbonic acid.

11. D'Arsonval's calorimeter for animals and men, as modified by the writer, is less liable to error than any other, as the agitator can be worked without opening the instrument or hardly disturbing the sawdust covering.

12. Human calorimetry shows that an adult after a full meal produces between 300 and 400 heat units per hour and not 110 calories, as Helmholtz theoretically obtained.

DR. DANA did not question the truth of the author's statements. But what interpretation should we make of the six thermotaxic centres he had described? Can the bodily temperature be regulated without them at all? He referred to a case of his that he had recently published, in which, although there was no cerebrum, basal ganglia or cerebellum and only part of the pons, yet the temperature was normal. The facts of human pathology should be brought into harmony with these physiological experiments.

DR. OTT said it was difficult to understand the regulation of temperature in Dr. Dana's monster. Injuries to the corpus striatum disturb the temperature, but the other thermotaxic centres serve to regulate it.

DR. H. W. BERG then read a paper upon

ECLAMPSIA INFANTUM IN ITS RELATION TO FEVER,

in which he took the ground that febrile eclampsia calls into activity two sets of nerve-centres, the thermogenic and the convulsive. An alteration or lesion is produced in the thermogenic centre by excessive hyperæmia, anæmia or some minute structural change, causing a rise of temperature; secondarily, it affects the unstable convulsive centre in the medulla, especially in infants whose medullæ are in an exalted state of irritation. He thought it probable that the motor and thermic nerves are intermingled in the medulla, and thus an irritation of one results in irritation of the other. Thus fever produces convulsions in children, while the process may at times be reversed, as in the status epilepticus, where, after a period of convulsion, the temperature begins to rise, and, as Bourneville has pointed out, may reach an enormous height. He would treat febrile eclampsia, not with antispasmodics, but with antipyretic remedies; in other words, treat the cause of the convulsions. In this he had had gratifying success in the use of antipyrine and antifebrine together with cold or tepid sponging with equal parts of water and alcohol.

DR. OTT said that children, no doubt, have feeble thermogenic centres.

DR. WM. LESZYNSKY referred to a report of his some years ago of twenty or more cases of status epilepticus in which the rise in temperature did not accord with the statements of Bourneville. As to treatment, he thought simple sponging with alcohol and water sufficient, and

that the use of the wet pack or of antipyretics was objectionable.

DR. WEBER asked Dr. Ott if antipyrin and phenacetin act by assisting the system in the dissipation of heat.

DR. OTT stated that antipyrin probably decreases heat production and increases heat dissipation. The same would be true of phenacetin.

DR. WEBER thought dependence must not be placed upon antipyretics in severe cases of infantile eclampsia. Chloroform should be administered by inhalation or chloral injected per rectum. He had seen cold water injected with success.

DR. SACHS did not believe the relation of eclampsia and fever exactly that of effect and cause. Were convulsion due to high fever, it would be curious that in a fever preceded at its onset by convulsion, although the temperature continues high or increases, yet there are no subsequent convulsions. The fever in epilepsy was not due to excessive muscular exercise. A case of his with hystero-epilepsy had recently had as many as two hundred convulsions in twenty-four hours, but without any elevation of temperature.

DR. HARWOOD had treated eclampsia with chloroform and with the wet pack, and could heartily endorse the conclusions of Dr. Berg as to hydrotherapeusis.

DR. BERG, in closing the discussion, said he thought the instance cited by Dr. Sachs, of a fever ushered in by convulsion, yet without further eclamptic seizures, in spite of the continuance of the fever, did not carry as much weight with it as would at first appear, for Hughlings Jackson had pointed out that the convulsive centres could become so exhausted that the fits would not be repeated. He prefers the wet pack now to sponging, because refrigeration by the latter method is more rapid and more dangerous. He had seen pneumonia produced by sponging. The pack is less harmful.

NEWS ITEMS.

Quarantine Conference.—Dr. Jerome Cochran, Health Officer of the State of Alabama, has just issued the following circular letter.

Under a joint resolution of the General Assembly, the Governor of the State of Alabama has issued to the Governors of the States of Texas, Florida, Louisiana, Mississippi, South Carolina, North Carolina, Georgia, Tennessee, Kentucky, and Illinois, invitations to appoint delegates to a quarantine conference to be held in the city of Montgomery, beginning on Tuesday the 5th of March, next, and to continue for such number of days as the business in hand may render necessary.

About two weeks ago, Dr. C. P. Wilkinson, President of the Board of Health of the State of Louisiana, addressed a circular letter to the health authorities of these same States, suggesting a similar conference to be held in the city of Jacksonville, Florida. Dr. Cochran has been in correspondence with Dr. Wilkinson, and the assemblage of the proposed conference in Montgomery meets with his approval.

The object of the conference cannot be easily overrated. It is to formulate in a way that will command the confidence of the general public and of the civil and sanitary authorities of the States concerned, and in the

light of our latest experience and information, the principles and regulations which should govern our Southern quarantines, and at the same time to arrange such plans for harmony and concert of action as may seem practicable and desirable.

It is earnestly desired that all of the States included in the invitation shall be represented in the conference by full delegations of such of their citizens as are best fitted to discuss the theoretical and practical problems involved in the rational administration of quarantine in the South. The occasion ought to be made a very memorable one.

The conference proper will be composed exclusively of the duly accredited delegates of the States; but other persons interested in quarantine matters will be heartily welcomed to seats on the floor, and to take such part in the discussions as under the circumstances may seem expedient.

To facilitate the work of the conference, experts, believed to be specially qualified, will be requested to formulate in advance for discussion, a series of propositions covering the subjects of maritime quarantine, railroad quarantine, municipal quarantine, depopulation of infected towns, refugee camps, panics, stampedes, disinfection, health certificates, etc.

The assistance and coöperation of all who have had experience in the management of quarantines, and of all who have studied the progress of epidemics of yellow fever are desired, and suggestions through the mails will be thankfully received by Dr. Cochran, at Montgomery, Alabama.

The American Physiological Association.—A regular meeting of the American Physiological Association was held in the rooms of Jefferson Medical College, Philadelphia, on December 29, and at the University of Pennsylvania on December 31. A number of interesting communications were read. Professor Reichert recounted experiments showing that the anterior columns of the spinal cord possessed no irritability of their own, or that the power of excitability was confined to the posterior sensory columns. He also showed that the rate of transmission of a nervous impulse differed under different conditions. Dr. J. Warren described some recent experiments showing that a sensory impulse, such as the explosion of a torpedo, reinforced the knee-jerk, and drew the curve showing the variation of this reinforcement with the interval between the sensation and the knee-jerk. Dr. Donaldson showed specimens from which it could be seen that the effect of a long electrical stimulation was to decrease the size of the nuclei of ganglion-cells, and that the amount of this shrinkage was roughly proportional to the duration of the stimulation. Professor Martin in one paper gave the determinations of the minimal and maximal temperatures consistent with life that the blood supplied to an isolated heart could undergo, and in another showed that the variation in the amount of carbonic acid given off by a normal frog and one kept in the dark was due to the optical and not the psychic differences of the two states, because a frog deprived of its cerebral hemispheres acts in this respect just like a normal frog. All of these papers led to interesting discussions; and the discussion of Dr. Reichert's paper induced Dr. S. Weir Mitchell to place at the disposal of the Society two hundred dollars, to be devoted towards

aiding research upon the rate of nervous transmission, especially in man.

The Society was hospitably entertained, and found much pleasure in visiting the laboratories of the Jefferson Medical College and the University of Pennsylvania. The members of the Society were invited to participate in the International Congress of Physiologists to be held at Basle in 1889.—*Science*, Jan. 4, 1889.

House-drainage.—Dr. J. S. Billings, in an interesting article in the January *Popular Science Monthly*, lays down the following principles of house-drainage:

1. Have no more fixtures and pipes than are really necessary, and have all the fixtures as close to the soil-pipes as possible. Do not put fixed wash-basins in any sleeping-room, nor any fixture in such a position that its outlet-pipe must run horizontally, or nearly so, beneath the floor for a distance of more than ten feet before it discharges into the soil-pipe.
2. Avoid, as far as possible, the placing of fixtures in the basement or cellar of the house. In a house properly constructed from a sanitary point of view, the basement or cellar should be entirely given up to heating and ventilating arrangements and to storage, and should not contain either kitchen, laundry, sinks, or closets. All the pipes for drainage, water, gas, etc., should be plainly visible and readily accessible on the ceilings or walls of this lower story, and this cannot be effected if kitchen-sinks or laundry-tubs are placed on the lowest floor.
3. Soil-pipes should be of cast-iron, of the kind known as extra heavy, and, for an ordinary dwelling-house, should be four inches in diameter, weighing about thirteen pounds per foot run. If the soil-pipe must be carried beneath the floor of the cellar or basement, it should be either bedded in cement or put in a brick trench with a removable cover. Every joint in a soil-pipe should be so made that it will not leak when the pipe is filled with water to a height of ten feet above the joint.
4. Provision must be made for the constant passage of a current of air through the soil-pipe from the bottom to the top, and it should have no dead ends. For this purpose it is necessary that the soil-pipe should pass up through the roof and be freely open at the top.
5. In order that a current of air shall pass through the soil-pipe, it must have an opening connected with the air below as well as above. Should this air which is to pass up through the soil-pipe be taken from the sewer, or from the air of the street? In other words, should there be a trap in the soil-pipe between the house and the sewer, with a fresh-air inlet between the trap and the house, or should the trap be omitted and the sewer be ventilated directly through the soil-pipes to the tops of the houses? The reply to this is, that where there are properly constructed self-cleansing sewers, having no cesspool connections, and the house connections of which are made under the control of the engineer having charge of the sewers, it is well to omit the trap between house and sewer, and let the latter ventilate directly through the soil-pipes; but exception should be made to this where the top of a soil-pipe would be on a level with or below the windows of inhabited rooms in a neighboring house. When the house-drains are connected with a cesspool, or with a sewer presenting the characters of a cesspool, it is safer to insert the trap; in which case there should always be a fresh-air opening between the trap and the

house. If the pipes and fixtures in a house are properly arranged, and the joints are all tight, there is very little risk to the inhabitants of the house itself in having a direct connection with an ordinary sewer without a trap; the danger really being to the inhabitants of neighboring houses. On the other hand, if the trap between the sewer and the house be properly inserted, it creates no risk of danger or nuisance in the house to which it is applied, and costs little. The argument that it checks discharges from the house and tends to produce deposit in the horizontal part of the soil-pipes next to it on the house side, is unsound if this part of the pipe has a proper fall and the top of the trap is six inches below the pipe; for I have examined pipes which had been twelve years in use under such circumstances, and found no deposit worth speaking of. The question is of more importance taken in connection with the ventilation of sewers by street openings as affecting the comfort and health of the community generally than it is to the individual householder.

6. The incasing of fixtures in wood should be avoided as far as possible. The best bath-tubs and wash-basins are those in which the overflow is through a stand-pipe which is lifted to discharge the water, thus avoiding side or end overflows. The best closets are wash-out, short-hopper, or siphon-jet closets. Every closet should have its own cistern, and the flushing-pipe from the cistern should be not less than one and a half inches in diameter. Housemaids' sinks should have a flushing-rim and a separate cistern. Fixed laundry-tubs should never be made of wood. Urinals in a private house are usually an unnecessary nuisance; if put in, they must be cleansed frequently by rubbing. It is better that fixtures should be opposite windows than against outer walls, to avoid dark places beneath and around them, and to prevent danger of freezing the pipes.

7. To prevent the passage of soil-pipe and sewer gases, with their suspended microorganisms, through the fixtures into the house, some form of trap must be used, and this should always be placed as close as possible to the fixture which it is to guard. The best form of trap under all ordinary circumstances is a water-trap made by a bend in the pipe, forming what are known to all plumbers as S or half-S traps. Such a trap, so long as it preserves its water-seal, affords ample protection against both gases and bacteria, and, in ordinary dwelling houses, it is easily protected against the loss of its seal by evaporation or by siphonage. If a fixture remains unused for several months, its trap becomes unsealed by evaporation. In the trap to the outlet-pipe from an ordinary wash-basin this will occur in about two months if the trap is not ventilated, and in about two weeks if it is ventilated. As regards siphonage, the proper ventilation of the traps is a sufficient protection in all ordinary habitations of three or four stories. The ventilation of traps is not, however, solely for the prevention of siphonage; it is of equal if not greater importance to secure a current of air through all parts of the pipes so as to promote the constant oxidation and remove the slime which lines all pipes devoted to house-drainage. The immediate agents which produce this oxidation or slow burning of the organic matter which smears the interior of the pipes are those bacteria which are called aerobic, because they flourish best where there is plenty of oxygen. These are Nature's scavengers; the great majority

of them are not dangerous to health, but rather tend to destroy or starve out the really dangerous specific forms. They convert the soil-pipe slime into gases and soluble products, which products are washed away by the next flush of water; and they should be given a fair chance to do their work by giving them plenty of air. Where a closet is only three or four feet from the soil-pipe, this ventilation is not necessary for keeping the pipe clear; but it is more than ever necessary to prevent the siphonage. It is only under such circumstances that I would use a trap specially difficult to siphon and without ventilation; but such a trap should be cleansed every six months, for a trap which will not siphon will collect filth.

8. Whether the work be for construction or for repair, see that skilled workmen are employed upon it.

New York State Medical Society.—In addition to the papers already announced, the following have been promised for the meeting of the New York State Medical Society, beginning in Albany on Tuesday, February 5, 1889, at 10 A.M.

"The Treatment of the So-called Perityphlitic Abscesses," by Robert F. Weir.

"Basedow's Disease," by H. A. Hopkins.

"Cranial Measurements in Twenty Cases of Infantile Cerebral Hemiplegia," by Edward D. Fisher and Frederick Peterson.

"Cases Illustrating the Curative Effect of Convex Glasses in the Strabismus of Young Children."

"On Some of the Minor Types of Pneumonia," by T. E. Satterthwaite.

"The Practical Application of Acoustics to the Physical Signs of the Human Chest in Diagnosis," by J. R. Leaming.

"The Importance of the Early Recognition of Cancer of the Cervix Uteri," by Henry C. Coe.

"Office Photography with the Flash Light," by Henry G. Piffard.

"Inferior Dental Neurectomy," by J. H. Glass.

"Vaginal Hysterectomy," by James B. Hunter.

"Septic Poisoning in Early Life," by Henry D. Chapin.

"Amblyopia in Diabetes," by W. O. Moore.

Gentlemen who propose to discuss any of these papers will confer a favor by sending their names to Dr. Roosa, 20 East Thirtieth Street, New York, without delay.

A provisional programme will be sent to the members of the Society the last week in January.

Alum in Bread.—PROFESSOR J. W. MALLET, of the University of Virginia, has been pursuing an interesting course of investigations into the effects produced by the use of alum in bread, and has found that, as has long been assumed, it is injurious. In the United States the greater part of the baking powders sold, it has been found, are made with alum, the acid phosphate of calcium, bicarbonate of soda, and starch. The result of Professor Mallet's inquiry, as given in the *Pharmaceutical Journal*, has been to show that these powders give off very varying proportions of carbonic acid gas, and therefore different proportions have to be used for the same quantity of flour to produce the requisite porosity in bread. When moistened with water they yield small quantities of aluminium and calcium salts in a soluble form. Most

of them leave, after use, the greater part of their alumina in the form of phosphate; but when acid phosphate of calcium is not used alumina is left. As the baking temperature in the interior of bread does not exceed 212° F., neither the water of combination of alumina or of its phosphate is removed from the residues of baking powder so used. However, in doses not very greatly exceeding such quantities as may be derived from bread as commonly used, Professor Mallet has found that hydrate and phosphate of alumina produced an inhibitory effect upon gastric digestion. He considers that this effect is probably a consequence of the union of alumina with the acid of the gastric juice, and at the same time of the precipitation of the organic peptic ferment in an insoluble condition like a kind of lake. A similar action may also be exerted by hydrate of alumina upon some of the organic matters of food. From the general nature of the results obtained, it is inferred that not only alum itself is injurious, but that likewise the residues resulting from its use in bread-making must be ranked as objectionable, and that the practice of adding alum should be studiously avoided when the object aimed at is to make wholesome bread.—*British Medical Journal*, January 5, 1889.

NOTES AND QUERIES.

ATROPHY OF THE SECRETING GLANDS OF THE STOMACH.

To the Editor of THE MEDICAL NEWS,

SIR: In THE MEDICAL NEWS of January 12th, I find this paragraph as the opening of the editorial article on "Atrophy of the Secreting Glands of the Stomach." It reads as follows: "The obscurity which always surrounds the diagnosis of atrophy of the gastric mucosa has been brought prominently into notice by the death of a well-known physician of this city, in whose case this diagnosis was accurately made—post-mortem," and it is further stated that "certainty in diagnosis has not yet been attained" by our present methods.

Permit me, from my own knowledge, to say of the case to which I suppose reference is made, that the diagnosis was accurately made during life, and that its correctness was confirmed post-mortem, but that the case was not one of gastric atrophy.

Of the nature of the disease it is not my province to speak—that belongs to another, and will, in due time, be made known. The disease was chiefly of the stomach, but not of the character inferred in the article.

Yours, very truly,

MORRIS LONGSTRETH.

PHILADELPHIA, January 17, 1889.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING JANUARY 19, 1889.

DICKSON, A. H., *Passed Assistant Surgeon*.—Detached from the "Pensacola," and ordered to the "Atlanta."

OLCOTT, F. W., *Assistant Surgeon*.—Detached from the "Atlanta," and ordered to the "Vermont."

THE MEDICAL NEWS will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.

Local papers containing reports or news items should be marked. Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

All communications relating to the editorial department of the NEWS should be addressed to No. 2004 Walnut Street, Philadelphia.